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Vol. V. DECBER, 1920. No. 2.

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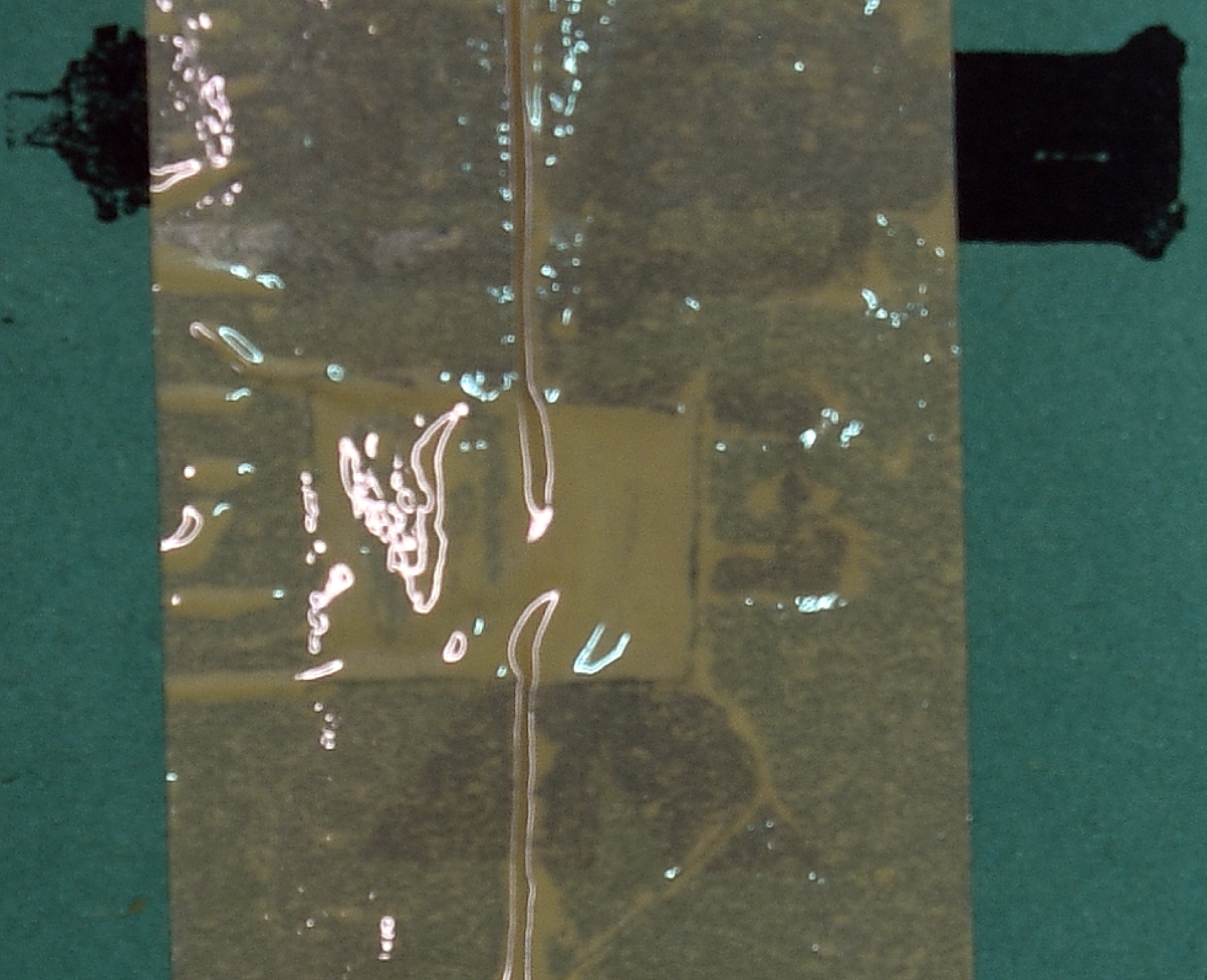

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The Madras Forest College Magazine.

Vol. V. DECEMBER, 1920 No. 2.

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THE
Madras Forest College Magazine.

Published Quarterly.

Vol. V. December 1920. No. 2.

The Madras Forest College Athletic Sports.

The annual athletic sports of the Madras Forest College were held on Saturday, the 9th October on the College Athletic ground. Messrs. Turing, Evans, Buckley, Longrigg, and K. R. Venkatramanier, and Capt. Irwin were the judges, Messrs Fischer, and Wilson the referees, Rev. Fr. Jambeau, and Mr. Berry the time-keepers, Messrs. Ardagh and Glover the starters, and Mr. Cornwell the recorder. The prizes were very kindly given away by Mrs. Turing, who came all the way from Ootacamund especially for the purpose.

The function was a great success, and this was in no small measure due to the indefatigable efforts of the Vice-president, Mr. Cornwell. Two of the events of the previous year's sports, "the log cutting" and "Slow bicycle race" were omitted and an obstacle race and boat race introduced, this year. Th "Willingdon Mêlée" had to be dropped for want of enough competitors, and as dusk was already falling when the obstacle race had been run.

It is very disappointing that only two old Students of the College were present to compete in the past Students, race. We hope there will be a larger attendance next year to afford scope for keener competition, and make the race worth running.

We offer our hearty congratulations to S. Ramalingam the winner of the Richmond Cup, and both to him, to S. C Ramalingam and to C. S. Ganapathi for winning their Athletic colours.

The sympathy of all present was accorded to S. C. Ramalingam who was unfortunate the whole day. He won the 100 yds. in good time, but was disqualified owing to having made a false start and the race had to be run again when he was not placed. Then in the high jump he did well and won fairly easily, but while trying to improve on the College record and when he had very nearly done so, he landed awkwardly on his weak leg--(weak since twisting it in the 100 yds. in the Grigg Memorial Sports)—and spraind his knee badly. Had it not been for these two misfortunes he was well in the running for the Richmond Cup We will hope to see him come to the front next year. [He has been awarded his Athletic colours in spite of not having obtained the necessary number of marks, as in the opinion of the President and Vice-president of the Athletic Club he deserves them.]

The points for the Richmond Cup and Athletic colours were as follows :—

[5, 2 and 1 marks respectively are allotted for the 1st, 2nd and 3rd place in each of the events noted below. Those who gain 13 points and above are entitled to Athletic colours. The highest aggregate wins the Richmond Cup].

Name of student	100 yards.	¼ Mile.	½ Mile.	1 Mile.	120 yards Hurdle race.	Long jump.	High jump.	Throwing the cricket ball.	Total
I. S. Ramalingam	5	5	5						15
II. C. S Ganapathi	1		2			5		5	13
III. S. C. Ramalingam						2	5	1	8
IV. Hans. Raj Datt					5		2		7

The results of the various events were as follow :—

A. Run off on the "Semi-final" day :—

I. Half mile race.

1st S. Ramalingam ... 2 min 30 sec.
2nd C. S. Ganapathi.
3rd Gopalan.

I. Throwing the Cricket ball.

1st C. S. Ganapathi ... 87⅔ yds.
2nd Mandanna.
3rd S. C. Ramalingam.

B. *Run off on the day of the sports :—*

I. 100 yds. flat race.

1st S. Ramalingam ... 12 sec.
2nd Gopalan.
3rd C. S. Ganapathi.

II. Long jump.

1st C. S. Ganapathi ... 16 ft. 6½ in.
2nd S. C. Ramalingam.

III. 100 yds. flat race for past students.

1st M. P. Subbayya.
2nd A. B. Fenn.

IV. High jump.

1st S. C. Ramalingam ... 4 ft. 10 in.
2nd Hans Raj Datt.

V. 120 yds. Servants' race.

1st Rangasamy.
2nd Mandanna.

VI. Hurdle race.

1st Hans Raj Datt.
2nd Bhandari.
3rd Narayana Rao.

VII. ¼ Mile flat race.

1st S. Ramalingam ... 61 sec.
2nd Abyaratne.
3rd Gopalan.

VIII. Invitation ½ Mile race.

1st H. Phillips (Stanes School)	2 min. 22 sec.
2nd J. Cameron	„

IX. Boat race.

Winning set.

1. Perera.
2. Gulrajani.
3. Krishnamachari.
4. Datt.
5. Bodas.
6. Gopalakrishna Rao.
7. C. S. Ganapathi (N. C.)
8. Manuel.
9. Wijesingh.

X. Mile Race,

1st Poonacha ... 5 min. 38 sec.
2nd Karumbayya.
3rd Ramamoorthi.

XI. Sack scrimmage,

Winning set.

1. Mandanna.
2. Deva.
3. S. C. Ramalingam.
4. Poonacha.
5. Nur Ahmed.

XII. Obstacle Race.

1st S. Ramalingam.
2nd Bodas.

After the obstacle race had been run, Mr. C. C. Wilson, the Principal of the College, made the following speech :—

"Ladies and gentlemen ; before I ask Mrs. Turing to give away the prizes I would request your indulgence for a few minutes as there are one or two points on which I wish to touch.

Our very hearty thanks are due to Mrs. Turing for coming all the way from Ooty to give away the prizes, and also to Mr. Turing for coming to assist us by judging. The unavoidable absence of Mr. and Mrs. Cox on this occasion, which is one of the two great annual functions of the Madras Forest College, is very much regretted by all of us who are in any way connected with the College.

We, the staff of the College, and Mrs. Wilson have been delighted to welcome so many old friends here to-day, more especially is our hearty welcome extended to all old students of the College.

The presence of one who was so recently a Senior Division Student is especially pleasing, and we congratulate him on his victory in the past Students' race. He would have done a better time had he not stopped to encourage his one flagging opponent. The attendance of Indian ladies and gentlemen at this function is always particularly gratifying as it shows that they take an interest in the physical development of their young compatriots who are under training here for that profession which needs more physical endurance than most others. Moreover, quite apart from any such consideration all of you who are, or have been, athletes well know that an appreciative audience is a great incentive to those who are competing in the various events. No College records have been broken today, but had we not been, in a way, unfortunate, it is probable that both the High jump, and the Mile records would have been improved on. In the High jump, S. C. Ramalingam when making an effort to break the record twisted his knee badly when he had almost succeeded; and in the Mile, had the winner Poonacha been at all pressed it is more than probable that he could have done the distance 15 to 20 seconds quicker, and as it is, he was only 8 Sec. behind the record.

The Richmond Cup and the *Victor Ludorum* for the largest number of marks have been won today by S. Ramalingam and their College Athletic Colours by S. Ramalingam and C. S. Ganapathi. Though we heartily congratulate the "Victor" on his success, yet it must be remembered that, he has been lucky. The re-run of the 100 yds. gave him first, instead of second place, and his time was much behind that of the previous winner He has however run well, and tried hard in several other events which are not included in the marks for the Richmond Cup; more especially did he do very well in the Obstacle Race, and once again we congratulate him heartily on his success.

Though, of course, our long distance running does not show the finish of a '*Shrubb*' nor our hurdling, the style of an "*Earl Thompson*", yet you will all agree I have no doubt that the performances today have been quite creditable, more especially, when you consider that the majority of the Students who come here have *not* been trained to such exercises from the time they are ten, or twelve years old, as is the case in England, the Colonies, and America, but have many of them, only taken to athletics since they joined this College.

Before I finish, I must offer our very heartiest thanks to those who have kindly officiated to-day in various capacities. Without their help the proceedings could not have gone off as they have with such smoothness and ease. There is yet another who is even more strictly responsible for the success of the meeting, and that is the Vice-president of the Athletic club, Mr. Cornwell. It is to his energy and technical knowledge that we are indebted for the preparation of the course, the invention and erection of the various obstacles for the obstacle race, and the training of the competitors, and his work in this direction has not been confined to to-day and yesterday, but has extended over some weeks and has been in addition to his many other pressing duties. Our heartiest thanks are due to him.

"I will not keep you any longer. but will ask Mrs. Turing to be so good as to distribute the prizes so ardously won."

The prizes were, then, kindly given away by Mrs. Turing.

Orissa Forests.

Orissa proper is broadly divided into Mongalbands, and Garjats. The Mongalbands, which are under the direct administration of the British Government comprise the five Districts, Cuttack, Puri, Balasore, Sambalpur and Angul. The capital of Orissa is Cuttack. The feudatory, and the Tributory states are called Garjats. There are in all 18 Feudatory States and 17 Tributory States. The Forests are mostly confined to these States which are hilly places, but the Mongalbands are everywhere plains except for a small area of plateaux and jungles. Again in Mongalbands, the struggle for existence being very keen every bit of land is turned to the best account, and the forests here are relegated to the worst soils, or to the mountainous or inaccessible localities not suitable for cultivation. The Mongalband forest are under the control of 3 Divisional Forest Officers whose Head quarters are at Puri, Angul and Sambalpur.

The forests of the Tributory States are managed by the Tributory Rajas, so the Government takes no interest in them.

But these forests which as already observed, are 18 in number, are of the greatest importance. The most important among them is the forest of Mayarbhanj state and this has no equal in Orissa as regards its forest produce; Second to it comes the forest of Kronjhar. The other state forests are of less importance than these two. All these are under the general control of an Agency Forest Officer who belongs to the Indian Forest Service, and under him there are for each state a Forest Officer under whom there are Rangers, Dy. Rangers, Foresters, etc.

But I shall give here only a brief description of the Kronjhar State Forests where I was working for the last few months before joining the College. This will, I hope, throw some light on the nature of the forests of Orissa, the manner in which they are treated, and the like.

The Forests of Kronjhar are divided into two classes:—

(a) Reserve Forests and (b) Khesra Forests *i. e.* the forests which are at the disposal of the State but are not included in the Reserved forests. There are altogether 12 Reserved Forests and 27 Khesra Forests the total area of the former being 600 sq. miles, and that of the latter, 1775 sq. miles. All the rules and regulations of the I. F. A. are rigidly and rightly applicable to these forests.

The annual income of the forest is about Rs. 2,50,000.

Situation and locality :— The essential feature of the Kronjhar Forest as regards its physical aspect is the existence of high plateaua and hills which at places aspire to become mountains. Nearly 1/3 of the area lies in the plains and the rest is covered with forests.

The soil is red earth, and at places it is covered with sandy loam. There are also rocky places here and there, but the greater part of the area is covered with alluvial soil as it is entangled with a net-work of streams and rivers and these enhance the economic importance of the Forests in providing transport facilities.

Climate :— Moderate except for a few places in the interior which are considered to be a bit malarial.

Rainfall :— Varying from 100″ upwards. The rainy season begins in the middle of June, and ends in the middle of October. The rainfall is heavy, though confined to these few months, and makes the country essentialy a forest one

Principal species :— Sal is the principal species of the forests of Orissa so much so that it is said to be a gregarious species in those forests. There is not a single forest in Orissa where there is no Sal.

Mixed with the Sal we find certain other species too, among which the following are of note :—

Pterocarpus marsupium.
Dalbergia latifolia.
Adina cordifolia.
Terminalia tomentosa.
    chebula.
    belerica.
Xylia dolabriformis.
Soymida febrifuga.
Gmelina arborea.
Diospyros melanoxylon.
Chloroxylon Swietenia.
Bassia latifolia.
Anogeissus latifolia.

Bombax malabaricum.
Artocarpus integrifolia.
Schleichera trijuga.
Mangifera indica.
Tamarindus indica.
Acacia catechu and
Engenia jambolana.

Sal being the only species among those mentioned, which is not abundant in the Madras Presidency I confine my remarks to that species:-

It is a tree with alternate, entire and simple leaves. In many deep valleys it attains a height of about 120′ and 12′ in girth where the soil is loamy and is very favourable for its growth. On the tops of hills it is stunted, growing only to a height of about 30′—40′.

It flowers in March and April and fruits in June and July shortly after the fire season.

The usefulness of the Sal tree cannot be overestimated. Its timber is used in various ways and it gives excellent fuel and charcoal. It coppices well and its seeds are used for medicinal purposes. The aborigines also feed upon its seeds during famine times Resin is exuded from its bark.

Commercial facilities of the forests:— The forests of Kronjhar, except those of Chargarh Sub-Range, are of great commercial importance on account of the presence of many rivers and streams and of the Bengal Nagpur Railway line which skirts its borders and encircles it on two sides. Besides this there are many pucca roads and cart tracks running hither and thither throughout the state and last of all though not of the least importance is the existence of a Telephone Line running throughout the length and breadth of the State.

The Economic importance of the forests :— The forests of Kronjhar abound in forest produce and mineral resources of various kinds which serve to satisfy multifarious demands ; hence they attract traders from great distances. The trees of the forest produce very good and valuable timbers. Chief among the mineral resources are iron, manganese, mica and a kind of stone from which various kinds of fanciful utensils are prepared (Stearite ?)

The B. T. T. & Co. is carrying on its trade in extracting sleepers and has taken up a contract to work the state forest for 20 years which amounts to a monopoly. The company is allowed to fell those trees which are above 5 ft. in girth and trees of this size or more are considered exploitable. Fellings of undersized trees are considered illegal and are heavily punished if detected. This company is carrying on trade on a gigantic scale throughout the state and has engaged a European Manager, and Asst. Manager who draw very large salaries ; and in addition there is a considerable staff working under these two, the size of which is a fair guide to the extent of the trade done by this company.

Besides this, there are other companies who are working in the state forest. They are, Messrs. Bird & Co., Messrs. Tata & Co., and Messrs. Villor & Co., Messrs. Bird & Co., is carrying on its trade on timber. Messrs. Tata & Co., has been granted a prospecting license for over 140 sq. miles to work iron ; and Messrs. Villor & Co., has been allowed a prospecting license over 80 sq. miles to work manganese. Again chargarh, one of the Sub-Ranges of the Sadar Range, is famous for the existence of a Mica mine there. To work out all these mineral resources one company has proposed to construct a Light Railway line connecting up the interior of Kronjhar with the B. N. R. line.

Besides these there are other licensces and lessees. The lac licence pays about Rs. 20,000/- a year for the monopoly of exporting lac throughout the whole of the state; for each Range there is a lessee of Tussor silk who has got the monopoly of exporting Tussor from the state. The revenue under this head annually comes to Rs. 30,000/- or more for the whole State. Mayarbhang and Kronjhar are famous for the indiginous production of very fine Tussor clothes.

The paper Mills of Seerampur solely depend upon the Saboi grass of Kronjhar; the bark of Cassia fistula fetches a large income.

In addition to these there are petty-timber dealers who export timber and fire wood from Kronjhar to Mongalband on a very large scale.

None but the Political Agent can grant a lease or license to any company.

Sylvicultural Management of the forest :- Among the 12 Reserves only two are being worked under the " coppice with Standard " method with a rotation of 30 years, and the rest are being managed under the Selection Method, and hence the forests are in a very irregular state. In these forests trees of 5′ girth or above are considered to be exploitable The object of the treatment of the two Reserves under coppice-with-Standard method is to turn them into High Forest and the local conditions of soil and climate of these Reserves under coppice-with-standard Method is to turn them into High Forest and the local conditions of soil and climate of these Reserve are very favourable; cleaning, thinning, improvement felling, climber cutting, and cutting back are some of the subsidiary operations carried out in the forests. Natural regeneration in these forests is the rule and until recent years nature received no assistance in this direction from man. Now-a-days they have begun to introduce artificial regeneration. Blank areas in the coupes and reserves are sowed and planted with seeds of the valuable species. It is binding on every forester to make sowings and plantings, in the blanks of the Reserves and the coupes of the Khesra Forests to an extent of at least 5 acres every year; failing this he is punished heavily along with the guards under him. The Range Officer and the Dy. Ranger are not excepted. They are responsible for their whole Range, and Sub-Ranges respectively.

Fire Protection:— Fire season commences on the 15th February and extends till the 15th June and before the commencement of the fire season, fire patrols are temporarily appointed for this season only. Their services are dispensed with as soon as the fire season is over. Each fire patrol is given a line of 5 miles in length on which he every day keeps watch.

Fire lines both of the Reserve and those of the Khesra forests are cleared, and burnt before the season begins. This is done by the villagers living within 5 miles of the line on both sides. The fire lines are theoretically divided into as many portions as there are villages within 5 miles on both sides of it, and each portion is entrusted to the care of the Padhan (village head) of each village in succession, who together with the villagers under him is entirely responsible for any loss or damage done on account of the fire lines not being cleared before the 15th February every year, and is fined to that extent as the Forest Officer thinks proper. This fine is shared equally by the villagers at fault. As soon as they finish the work of clearing the lines the local Forester pays them the wages at the rate of Rs. 5 per mile which is generally paid to the Padhan who distributes it proportionately among them.

The villagers are to some extent held responsible for any breaking of fire in a forest if, though knowing of it, they make no attempt to extinguish it or if they don't send the news of the fire to the nearest Forest, or Police Officer.

Besides these people, others who are bound to assist the Forest and Police Officers in putting out fires are the village officer and such other men as exercise any right in the forest. If they do not render this necessary help, they may be punished under the law. Again the Dy. Ranger and the Forester live during fire seasons near the Reserve forests. All these precautions have proved very successful and cases of fire are very rare. That such a grave responsibility has been imposed, upon the villagers is not for nothing. The villagers are allowed many concessions in the enjoyment of the forest produce. They are allowed to take fuel, and their annual supplies of wood practically gratis for which they pay an annual cess called the Nistar cess which is nothing in comparison with the benefits they derive from the forests. The Forest department has established a certain contract with the villagers which will be decribed later on.

Grazing :— Grazing is not allowed in those coupes where the coppice shoots are below 5 years old. The owners of cattle have to pay a grazing tax to the Forest department and are given a right to graze their cattle in the Forests for the whole year. If any body fails to pay this tax in the first year then he is bound to pay double the amount in the second year and if he cannot pay the same in the 2nd year, then double taxes for the 1st and 2nd year and a single tax for the 3rd year alone can be realized from him. But the Forest Subordinates are at liberty to impound the cattle of the defaulting man at any time for non-payment of this tax. When this happens the grazier is liable to pay a fine for releasing his cattle from the pound in addition to the payment of the tax which must be paid at the same time to the pound-keeper who will send the tax to the Forest Dept.

Method of working and transporting the timber :— The coupes of the reserved Forests are auctioned to the highest bidder; he fells the trees at his own cost, leaving those trees which are marked by the Forester as Standards, and stacks them in a convenient place selected by the Range officer for the purpose; here the timber is measured and marked by the Range officer himself or by the Dy. Ranger. When this has been done the dealer can remove the wood, but before this he must get a permit from the Range officer containing the number, kind and size of the timber in transit. This timber is liable to be checked by any officer of the Forest Department. If any discrepancy occurs it may be sized and the matter must be reported to the Range officer. I may here add that when any auction in respect of any forest produce is closed in anybody's favour, the man is required to deposit $\frac{1}{4}$ of the amount realised at the auction that day; in addition to this, another sum fixed by the Forest officer has to be placed as security deposit; or a personal surety has to be obtained from a third party to the effect that he will be responsible for a similar sum and that if the lessee carries an illegal trade the amount of the security deposit may be forfeited to government.

If any case is proved against the trader of his illegal trade, then his Patta (license) is cancelled and all his deposited money is forfeited in addition to such other punishments as are inflicted upon him.

As regards the extraction of the timbers from the Reserves treated under the selection method, except those that have been leased out to Messrs. B. T. T. & Co, and others, the traders have first of all to obtain the permission in writing of the Forest officer allowing them to trade in timber. These men are given permits for the timber as much as they require on payment of the usual royalty by the Range officer but they are given a limited time within which they must remove all the timber as otherwise the timber is liable to confiscation. They cannot fell any and every tree according to their pleasure. These are first marked by either the Dy. Ranger, or the Forester and then they may fell them. Disregard of any such rules is severly punishable.

The coupes of the Khesra Forests are not as a rule put up to auction. They are only meant for the use of the bonafide inhabitants of the state.

Rights of the people:— The bonafide inhabitants of the state pay an annual tax called the "Nistar cess" to the Forest Dept at the rate of Re. 1 per annum on each acre of land in their possession; and are allowed fuel and other kinds of wood for the annual repairs of their houses, and agricultural implements free of royalty. There is a limit above which they are not entitled to get. If in addition to this they require more, they may have the rest on payment of the usual royalty.

But because they pay the Nistar cess and have a right to get wood gratis, they cannot fell any and every tree according to their own sweet will and at any time and place. They have to get a printed permit which is called "the Free Permit" on the strength of which they are allowed to cut the wood. This permit is every year issued in the name of the Padhan (Head man of the village) of each village. Before December every year, every Padhan is asked to put in a petition stating the number of people living in his village with the number of acres of land each has in his possession and the volume and quantities of fuel and other necessary timbers which will last all of them for the whole year. This permit is issued only once a year in proper season. Each Padhan is then given a permit for his whole village specifying the number, girth and volume of wood they are entitled to get, the local limits within which and the season during which such removal is permissible. These permits are issued between the months of December and March every year, and are issued only for the opening of new coupes every year by the villagers themselves. The Standards are marked by the Forester with the help of the Guard who also checks from time to time the wood cut and removed by the villagers; there is therefore very little chance of any theft or abuse. They can get these woods only for their personal use throughout the whole year. They cannot trade in timbers which are given to them free of royalty The opening out of coupes and the clearing of them are thus being done by the people. No cooly is required for the purpose, so the Dept. gains to some extent by this system. Every year before march all these things must be finished. After March no felling is allowed as after that healthy and vigorous coppice shoots do not appear.

If any man fells any tree without coppicing it or fells a tree which is reserved as a Standard he is heavily punished. Thus the Forest Department has made a sort of contract with the people The Department allows wood free of royalty to the people for the whole year, and the people help the Department in various ways.

The "Nistar cess" which they pay is a sort of permanent income for the Forest Department. It cannot fluctuate from year to year according to the increase or decrease of demand and supply The people have got another right in the reserved Forests also. For household purposes they can get wood from the reserve on paying half the royalty. But the Free Permit system does not hold good in the case of Reserve Forests.

The Range Staff and their duties:— Each Range is divided into 2 to 4 Sub-Ranges each in charge of a Dy. Ranger who is otherwise called a Sub-Range officer, and under each Sub-Range officer there are from 3 to 5 Foresters, and under each Forester there are 5 or 6 Forest Guards. The Range officer is the head of a Range.

The Range officer has got for his Office Staff one English correspondence clerk, 2 Vernacular clerks, one Forest Surveyor, one office Peon, and one orderly Guard.

The Range officer devotes at least 15 days a month to office work and the rest of the month he tours in various parts of his jurisdiction supervising the work of his subordinates. The Range officers compound Forest cases and realize fines from the Forest offenders but these cases are subject to the final approval of the Forest officer.

The Dy. Rangers realize revenue, and supervise the works of the Foresters and Guards under them. They are required to inspect each Forester's office works, cash accounts etc, at least once a month. Again the Range officer having very heavy office work the Dy. Rangers generally help him in carrying out the outdoor works.

The duty of a Forester is to realize the revenue, to issue permits, to detect cases of illicit felling or grazing and to tour in the Forests in his jurisdiction for not less than 20 days a month. The remaining 10 days he devotes to office works. This office, in addition to being inspected by the Dy. Ranger at least once a month, is inspected once after every 3rd month by the Range Officer, and the Forest Officer inspects it once a year. The Forest officer keeps a general control over all the Range Officers but the Range officers are allowed to exercise their own discretion in making any suggestion they like.

Hill tribes:— Lastly I shall give a very brief account of the tribes that live in the jungles.

These tribes are the *Santals, Kols, Bhumijos, Juangas, Nodhas* etc. They generally live in the hills and forests and carry on shifting cultivation. They don't settle down in any place permanently. They worship a certain species of tree as their God. They observe caste-distinction and each of their tribes has a language of its own. They generally live upon roots and fruits of the forest and the flesh of the animals which they kill with their arrows. They can kill even an elephant with an arrow. They are very ferocious, and brave They are very submissive when treated with kindness but are quite the reverse when one tries to bring them under control by the application of force. A conciliatory method is the only safe way in which to deal with them

BALAKRISHNA DAS.
(Orissa).
Student, Junior Division.
M. F. College.

A Short Note on Lac in the Madras Forest College Estate.

The introduction of lac on babul in the College Estate was engaging the attention of the authorities for some time. Arrangements were made a few months ago with the Inspector-General of Forests, Hyderabad, for a supply of brood lac in October. *Pithecolobium saman*—Rain tree—was suggested by the undersigned in preference to babul for experiment as it is a faster grower and has branches more succulent. With this view the Senior Division students pruned those trees growing on the wind-belt at the western end of the College during the last week of August, but happily a careful examination of some of the trees in this belt revealed the fact that lac has already been established on them. 14 trees were found to bear lac and these were inspected by the undersigned from time to time. Before recording the results of the observations, a short description of lac and how it is produced will afford interesting reading.

Lac is a resinous encrustation produced by an insect which sucks the juice of plants and transforms this juice into resin which completely surrounds it. This insect belongs to a group of insects called *Coccidæ* commonly known as Scale insects. It is found growing spontaneously on a large number of trees, but is specially grown on *Schliechera trijuga, Butea frondosa, Zizyphus jujuba, Ficus religiosa, Acacia arabica, and Albizzia lebbek.* The resinous substance contains a crimson dye known as lac dye which was formerly of great value but has been almost entirely driven out of the market since the introduction of aniline dyes. The resinous substance known commercially as Shellac is used in the manufacture of varnishes, cements, sealing wax, lacquer work, lithographic ink. gramaphone records, and many other purposes. The cultivation of lac is a very old industry and was known to the ancients

On examining a twig covered with lac one will find a number of resinous globules adhering closely to the stem. These are the full grown females containing fertilised eggs. When the eggs mature small deep-red insects come out from a hole situated at the posterior end of the body of the female and begin to wander about in search of suitable places to fix themselves. This happens twice in the year. At the time of emergence the young insects are very minute and deep red in colour. They are very sluggish in their movements and wander about until they come upon a suitable spot to fix themselves. When once fixed they cannot be removed. They are gregarious in habit and settle down on tender branches., on which they feed. The food taken into the body is transformed and passed out uniformly all over the body in the form of resin, which after a few days completely encases them. Feeding goes on actively. Differentiation of the sexes can be noticed by the shape of the cells which in the male is elongated and in the female globular. Whitish hairs project from the cells which serve as breathing organs for the insects. When the cells complete their growth, winged and wingless males emerge and fertilise the females and die. After fertilisation the females develop fast. They take in more sap and exude more resin and swell up. After laying eggs the females continue to shrink and die. The young insects are hatched out after some time, and after emergence begin to feed as before.

There are two broods in the year—the October and the June; in the former inoculation, the females continue to grow for over eight months while in the latter they grow only for over three months.

Lac insect has many enemies. The ants frequent the trees for the sake of the sugary excretion known as "honey dew" exuded by the insects. The ants break off the whitish hairs which carry air to the females within the cell. The result is that the host dies of suffocation. To avoid this all lac bearing branches were smeared with a sticky substance called "Tanglefoot". The caterpillars of certain moths eat the lac larvae, while men, monkeys, squirrels and birds, fire and hot wind also damage the crop to some extent.

All lac bearing branches were ring marked and numbered with tar and the results of observations are recorded as follows :—

No. 1. A small tree. Healthy lac is seen in places. Swarming commenced during 1st week of October 1920, and the insects have settled down to feed. Remains of last swarming are seen, but the young insects have suffered in competition with mealy bugs.

No. 2. A sapling. Lac bearing branch one. Swarming commenced during 2nd week of October.

No 3 A fairly big tree. Lac bearing branches are higher up the tree. Brood healthy.

No. 4. A sapling. Lac bearing branches two. Swarming commenced during 2nd week of October and insects have settled down to feed.

No 5. A small tree. Lac bearing branches two. Swarming commenced during 2nd week of October and insects have settled down to feed.

No. 6. A sapling. Lac bearing branch one. Swarming commenced during 1st week of October. Insects have settled down to feed.

No 7. A sapling. Lac bearing branch one. Brood healthy. Swarming commenced during 2nd week of October and is not yet complete.

No. 8. A big tree. Lac bearing branches are two at the top. Brood is healthy. Swarming not observed.

No. 9 A sapling. Lac bearing branch one. In spite of the attack by caterpillars swarming was very profuse, commenced during 1st week of October, and insects have begun to feed.

No. 10. A small tree. Lac bearing branch one at the top. Brood looks healthy. Swarming not observed.

No. 11. A small tree. Lac bearing branches two. Last swarming has suffered considerably in competition with mealy bugs. Brood at present is not healthy. Swarming not commenced.

No. 12. A sapling. Lac bearing branches two. Brood healthy. Swarming not commenced.

No. 13. A sapling. Lac bearing branch one. Brood healthy Swarming not commenced.

No. 14. A small tree. Lac bearing branch not healthy. Swarming not observed.

The observations will be continued, and the next brood which would be ready by next June will be utilised for inoculation of non-lac-bearing trees. The inoculation is done by tying at both ends sticks containing brood lac to the tender branches by means of straw or plantain fibre so that the insects when they emerge can easily travel and settle on them to feed.

M. R. Sundaram Ayyar,
Instructor, Madras Forest College.
21—10—20.

Bamboo-extraction by "Erikulas" in Cuddapah and Kurnool.

The agricultural classes in the rich, dry taluks of Cuddapah, and Kurnool districts have a special fancy for articles made of bamboo, for a variety of purposes, such as, of storage and export of grain, carrying manure to fields, tattis for use in indigo preparation etc.

Erikulas are a tribe of the said districts whose profession is the manufacture of furniture, and articles out of bamboo. They sell the ready made furniture generally in exchange for grain. They go to the forests, fell the bamboos, and prepare splits once a year in the months of December, January, and February. These expeditions are made in parties of men, and women, not less than 50 in a batch, with sufficient provisions to last for at least a month, and they carry their necessities on pack donkeys. They are fond of forest life, and camp generally in a place where there is a shrine to their patron Goddess "Mallalamma." Such spots are generally good camping places with convenient water. They perform a ceremony in the name of the said Goddess in the belief that their work will progress well as a result, and that they will not meet with serious obstacles.

Their baneful method of working:— Their method of working is as follows: They obtain a coupe chit from the contractor who has taken the Forest Bamboo contract and pay him the rates settled. The contractor enters the voidah in the chit. Afterwards they commence working. For felling the bamboos they use knives resembling those of "*Maderas*" a tribe allied to them and of more or less the same profession. They are unskilful in many ways, and are not at all business-like.

They cannot clean the clump with their knives; they cut straight and healthy culms wherever they find them, and do not work regularly from strip to strip; they cut the culms at an objectionable height, four or five feet from the ground. Even though they are given clear instructions as to how the work should be done, and how necessary it is to clear the clumps, and leave the required portion of healthy culms in each, they do not carry them out; this is because it is cheaper, and therefore better from their point of view to work irregularly. They, therefore, wander about the area in search of straight, healthy bamboos, going from one clump to another as they please, and will not take the trouble to work systematically. After felling the bamboos, they collect and heap them in hundreds here and there along the footpaths so that they may easily find them for splitting, and removal on their donkeys.

Splitting :— When they split the culms they take only the outer hard green portion, and leave the rest (i. e., the soft portion) behind. This refuse is left in the jungle lying about in heaps, and it is very combustible. They will not take the trouble to collect this refuse, and stack it in a safe place away from the forest growth. The consequence of all this is that danger from fire in greatly increased.

Remedy suggested :— (1) These *Erikulas* should not be allowed to enter the forests, and fell bamboos under any circumstances. The contractors should employ trained coolies procurable in all the adjoining villages of the Nallamalais. After felling the bamboos they should collect them in one place and sort them according to the different sizes and requirements The *Erikulas* can then very easily purchase the green freshly cut bamboos and use them for any purpose that is required. This would save much trouble both to the contractor, and to the forest subordinates in getting the coupes properly worked

(2) The bamboo areas should be divided into coupes, and strips of small width laid out along paths, and natural boundaries such as streams. The area should be worked strip by strip, evenly from one end to the other.

(3) Clearing or cleaning of clumps should be first taken in hand; this involves removing dead & unhealthy culms. Some 5 to 10 healthy culms should be evenly distributed and left uncut in each clump as protection for the coming shoots.

(4) No tender bamboos of less than a year old should be removed. Generally the *Māderas* cut such tender ones for basket making and the like, for which, owing to their flexibility they are especially suited.

(5) Stumps of cut bamboos should not be higher than 1½ to 2 ft.

(6) The rubbish collected in cleaning the clumps should be stacked in open spaces, near by.

(7) No refuse or rubbish should be heaped up near tree growth of any kind as it is very dangerous during fires.

G. Venkatasubba Rao
Madras Forest College.
1919—21 Division.

Kumri cultivation in south Coorg Forests.

This cultivation, better known as '*Thekkalu*' or '*Pona*' cultivation on the west coast, or '*Thangaya*' in Burma, consists in the raising of a forest crop in association with a field crop. In the forests of south Coorg. the total area brought under cultivation of this kind from time to time, extends over some 2,000 acres, along the western zone. Till 1918 teak was chiefly cultivated along with the field crop, but now *Pterocarpus Marsupium*, and *Dalbergia latifolia*, are also cultivated with Teak in accordance with the instructions of the Inspector-General of forests for the Government of India, as a pure crop of Teak deteriorates the soil, especially a mediocre soil.

In this area sites are selected by the Range officers concerned, — with the previous orders of the District Forest officer—in the months of October or November; they are always selected so as to adjoin the Kurubar settlements, and the Kumries of the previous years, so that in course of time these Kumries will form an extensive plantation, These sites are always selected along the western boundary of the forests as this portion forms a thick sheet of bamboos, and auxiliary species of considerable height growth, with very little teak of good development. There is no trouble in selecting sites as the sporadic growth of teak and other principal species is a sure indication that the soil is well suited and conducive to their growth Spurs and ridges must be avoided as the soil in those places is laterite, which is not at all suited for teak After selecting the site, plots not exceeding two acres each are given to each family of Kurubars. They begin clearing the jungle trees, and undergrowth at once. Valuable species are cut, and removed by contractors at half seigniorage rates, and they have to remove the produce before the clearing is set on fire. The chief reason for giving this produce at half rates is that there are no roads to facilitate removal, as this bit of land is away from the working areas; thus an extra expenditure on extraction is made good by the low rate. Besides, it is very difficult to get contractors to buy this produce and otherwise it will have to be burnt without any profit to the department. In the month of March or April after all the saleable produce is removed, the area is set on fire and any remnants still remaining are collected and reburnt subsequently. April or May is the sowing season. Before sowing, the whole kumri is divided into three blocks Teak is assigned a block, one half of the total area, and *Dalbergia latifolia* and *Pterocarpus marsupium* the rest of the area equally. Pegs are driven in at a distance of 6` × 6` in lines, and soil is raked up round the pegs for the reception of seeds. In the case of teak 6 – 7 seeds, of *Honne* (Pterocarpus Marsupium) 3 – 4, and of *Biti* (Dalbergia latifolia) broken pods containing about 12 – 15 seeds are put in at each stake and lightly covered with earth. The sowing should be completed before the end of April because soon after, we get occasional showers which help germination.

This operation is as above stated combined with agricultural cultivation and the chief cereal sown is Ragi, the staple food of dry districts of southern India. As soon as sufficient rain falls ragi is sown all over the area, excepting $1\frac{1}{2}'$ round the pegs. Due care is taken by the subordinates concerned to see that no seedling is over topped by this crop, and in such cases they get it uprooted to the required distance. This period is more important than any other as at this stage the seedlings require more light for their further development. These field crops not only keep down all other noxious growth which threatens to cover the whole area by its aggressive growth, but also protects the young seedlings from too intense light and heat. The cultivators are only allowed to harvest the ears of corns and the stalks are left uncut for two reasons; first to protect the soil as otherwise it would be exposed and become bare and secondly to give shade to the young seedlings. At the close of the hot season this stuff will be burnt with the seedling so as to get vigorous shoots early in the rainy season and also to prepare the soil for one more agricultural crop.

Weedings will be done twice or thrice in a year by the Kurubars themselves and this chiefly consists in uprooting all the *lantana* and bamboo seedlings all over the area, and other harmful annual weeds round the plants. This work keeps all the kurubars,—women, boys, and old people,—engaged throughout the year. In the month of October or November the crop will be ready for harvesting. In the course of weeding all seedlings are heavily mulched with green leaves as this system not only keeps down the weeds but also protects the young seedlings from the sun, and gives manure when they get dry; this is renewed whenever and wherever necessary.

The kurubars cultivate this area for two years and during this period they are solely responsible for the growth and preservation of the seedlings. In return for their work they are given rewards proportionate to the number of successful plants raised by them. All the seedlings are counted in the first year, and paid for at annas 10 per 100, and again in the second year the same rate is paid for successful plants. Formerly enumeration of seedlings was done at the end of the second year and paid for at Rs. 1—4—0 per 100 plants. This system was discouraged, because, the kurubars began to neglect their kumries in the first year, and raised as many plants as they could in the second year in order to get full payment.

In this way large areas of forest are brought under cultivation, with two objects which are more important in forestry than any others. The first is that Kurubars settle permanently in the forest owing to concession described above being extended to them and thus the supply of labour is efficiently maintained; secondly large areas of beautiful fertile forests, which are at present evergreen with tremendous sized bamboos junglewood and other useless growth, are converted into fine plantations without much expense.

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Field work done at Head Quarters by the Junior Dn. Madras Forest College.

It may, at the outset, be remarked, that there is not much scope for any really good field work during the Head Quarters Term. The greater part of the time is devoted to the study and the understanding of some general principles connected with forestry, without which their application in practice cannot be appreciated. One day in a week is set apart for field work and then much cannot be done or shown. Further the College estate is very small in extent, and the soil is so poor, that there is very little work of forest conservancy, improvement, or protection, which can be demonstrated there in an efficient manner. But, whatever is possible under these limitations is done.

The first week work was confined to a study of the shears, Derrick, fuel shoot, and fire observation post, erected on the Engineering park by the last batch of students that passed out of the College. The Instructor explained briefly their working and uses, after which the students set to work to dismantle them one by one. The parts were afterwards carefully transported to the stores godown.

The next work was brick making. The black cotton soil of the estate is not a good material for making bricks with. We tried various proportions of sand with this soil to get at the proper consistency. Three parts of sand to seven of black cotton soil gave a satisfactory result, and we made about a thousand well-shaped bricks. These were burnt in the manner of the English kiln; the quantity of fuel used was one and a half cartloads of Acacia arabica. The bricks thus obtained were then made use of in raising the walls of the kiln by the depth of 3 bricks

So much for Engineering study—Then, as regards sylviculture, our first work was transplanting seedlings from the nursery beds into specially prepared bamboo baskets. The most successful species in the beds were *Melia indica*, *Albizzia Lebbek*, and *Wrightia trinctoria*. Later on, towards the close ef the term, baskets of Melia and Albizzia were transferred to a clear-felled strip in the Demonstration Forest, and planted there in alternate pits, six feet apart, dug along lines also at intervals of six feet.

Our next work was the eradication of prickly pear in a part of the college estate. Iron hooks, with sharp edges, attached to the ends of thin bamboo shaves, proved very useful in pulling up and dragging away prickly pear. The ground was well hoed up so as to remove any roots that were left. All this uprooted stuff was thrown into pits about 3 feet deep, and there beaten with heavy sticks. It was then left to dry for a week, and afterwards covered with a thin larger of kankar over which earth was thrown to close up the pit.

After this we proceeded to do fellings in strips 4 and 5 of the I Periodic Block of the Demonstration Forest in the College Estate. Each strip is only 2 acres in extent, and the standing crop is pure Acacia arabica. The method of working adopted for this Forest is what is technically known as the "shelterwood compartment system." Regeneration of the crop, and the tending of the seedlings are carefully attended to by means of successive fellings over each strip. The mature crop is not removed until regeneration has been effected satisfactorily, and the seedlings are able to grow well without the shelter and protection of their mother trees. The College derives a certain amount of revenue from these fellings. The fellings that we did were of the nature of secondary fellings in strip 4, and seed felling in strip 5. We realised on the whole about 85 c. ft. of timber pieces, 100 c. ft. of firewood and 5 cartloads of brushwood. This material was shortly afterwards sold by auction.

P. SITHAPATHI AYYAR.

Eucalyptus in Tasmania.

Extract of letters from Sir W. Denison, Lieut. Governor of Tasmania* 1847—1855, *Governor of New South Wales* 1855—61, *Governor of Madras* 1861—66 :—

Letter dated Hobart Town, 5—2—1849 :—

" Ship-building is going on, on a large scale; Vessels of 600 tons have been built, and a large number of from 200 to 300 tons & upwards. The timber (Blue gum) is to be got of any size: one builder laid down the other day a keel 120 ft. in length, and this was one out of 4 pieces of scantling of the same size, cut out of one tree. I should think that we might very well supply plank to any extent, if it would be worth the freight home: from all that I can learn it is a most durable wood, and well worth the attention of ship-builders; its weight and hardness are the only objections to it................"

Letter dated Slopen Island 18—4—1849 :—

" .... The trees are all of the gum tribe, but beautiful as regards their quality for all economical purposes; large, straight, without any lateral branches. The two which had been prepared for sawing were by no means of unusual dimensions. The men stand on a stage about 14 ft. from the ground; they first cut with axes a notch nearly half through the tree on the side on which they want it to fall, and then begin to saw it on the opposite side, driving in wedges in order to prevent the saw being nipped or fixed in the cut.............."

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* Reprinted in "Varieties of Viceregal life" by Sir W. Denison, published by Longmans, Green, London 1870.

The dimensions of two trees cut on this occasion were :—

	Height above ground level.	Corresponding girth.
Tree (a)	14′	14′
first branch ...	149′	8′
Tree (b)	12′	13′
first branch ...	172′	7′

"Now these are the ordinary sized trees of the forest where the soil is strong; and these I measured, or saw measured myself. The dimensions of the next trees (c) and (d) I give upon the evidence of a clergyman who measured them."

Tree (c) not felled

130 ft. in girth at ground level,

102 ft. 4 ft. above ground level.

Tree (d) felled.

	Height above ground level.	Corresponding girth.
	At height of stump. (Exact height not specified, but about 14′ above ground level)	30′
first branch ...	220′	12′

This tree "had 64 ft. of head above the first branch," so its total height was not less than 284 ft.

"The tree that I measured were from 270 years to 300 years old, judging from the annual rings, and the timber of the Bluegum is as good as can be found in the world, I believe, when properly seasoned."

Letter dated Hobart Town 3-5-1850 :-

"............ I have got an order for 100 loads of Bluegum timber for the dockyards and will send such as has seldom been seen, as far as length is concerned. I can give 150 ft. easily; many of the trees measure that up to the first branch, the total height being 260 or 270 ft. and the girth from 20 to 30 ft. The heart wood is not used; therefore we do not get very heavy logs, but for planking or sided timber it would be invaluable. Deck timbers would be got in one piece. I have known four keel pieces, each 120 ft. long cut out of one tree................"

Letter dated Hobart Town 15-3-1851:-

A number of timber specimen's were sent to the great exhibition of 1851. One specimen (**Tree (e)**) was a plank 166 ft. long and 2 feet wide at the small end, which was sawn at the convict establishment at Port Arthur. It proved to be too long to be taken on any ship in the harbour.

Again, (**Tree (f)**) gave measurements as follows :—

	Height above ground.	Girth.
	3′	29′
	6′	22′
first branch ...	167′	8′
Second branch ...	181′	7′ 5″
3rd branch & cluster of branches ...	215	4′ 2″

a plank of 176 ft. in length was sawn from this tree; 50 ft. of the plank was broken in getting it out of the bush; but the remainder 126 ft. in length was sent to Liverpool.

Tree (g)

A log lying on the ground near Port Arthur.

Dimensions :—

Height above ground.	Girth.
20′	29′
75′	19′ 6″

The timber was quite scund.

A few points must be noticed with regard to the above letters. The measured trees were not necessarily all Bluegums (Eucalyptus globulus). The statement in more than one of the letters, that the heart-wood of Bluegum was not used (being presumably too hard for easy sawing) and was very heavy, is interesting. So also is the ring counting mentioned in the letter of 18-4-1849 because on the Nilgiri plateau the rings on Bluegum stumps, if indeed they are annual rings, are not sufficiently distinct (in the present writer's opinion) to be of use is finding the age of trees. This is possibly due to the equable climate of the Nilgiris as opposed to the well marked seasons of Tasmania. However it is interesting to note that in Tasmania the trees remain sound (and probably put on an appreciable annual increment) up to, at least, 270 to 300 years. The oldest trees on the Nilgiris are but little more than 60 years old, at which age they reach a girth of 10 to 12 ft. when grown in High Forest (c f. Marliamund). Trees grown in an isolated position attain a much greater girth in the same time (say 20 to 24 ft. in 60 years.)

These are not random figures. 4 trees sold standing in Marliamund in 1919 (just behind Fox How on the Snowdon road) aged 59 years yielded timber which was a revelation to the present writer and calls to mind an editorial note in the Australian Forestry journal fer Feb. 1919. In an article on " Forestry in Central Africa it was stated that

"It seems a pity that Eucalyptus globulus, a tree of poor economic value, is so much planted in foreign countries" To which the Editor added a foot note "This reference to Eucalyptus globulus as a tree of poor economic value will not find many supporters— It is regarded in this country (Australia) as one of the best in the mountain regions".

As regards height growth of Eucalyptus it seems doubtful if the Nilgiris can compete with Australia and Tasmania The tallest tree in the Nilgiris is probably under 220 ft. in height, and the mean height of dominant stems grown under High Forest conditions appears to be 175 to 180 ft. in the best situation.

The clergyman's tree (tree (c)) mentioned in the letter of 18-4-1849 is difficult to believe. Probably there was some mistake, but the figures are given as printed in Sir William Denison's book.

J. H. LONGRIGG, I. F. S.

The Forests of Madras.

AN INTERVIEW WITH THE HON'BLE MR. S. COX.

The Hon'ble Mr. S. Cox, Chief Conservator of Forests, was good enough to meet the members of the Publicity Board on the 17th July to discuss with them certain aspects of forest policy. Some visitors were also present at the discussion.

Mr. Cox's attention was specially drawn to the prevalance of the idea that the Forest Department is standing in the way of an increase in agricultural production by

(1) unnecessarily keeping cultivable land from cultivation, and

(2) failing to do all that might be done to supply ryot's needs in the matter of grazing, green manure, and other requirements.

Mr. Cox said that he was aware that there was a general impression abroad that the Forest Department was, if not hoarding its resources, certainly not using them to the best advantage; and he welcomed the opportunity to place before the public some facts connected with these forest questions which were little understood.

Most of the misconceptions which had arisen were due to the fact that the Forest Department, so far as he was aware, had never taken any steps to explain to the public what the resources of the Government forests really were; and much of the criticism of the Forest Department was based on information derived from villagers and others who had, like most other people, their own axes to grind. A correct appreciation of the facts could really be obtained only by an examination of the forests themselves, and anything that he or other officers of the department could do to facilitate the inspection of the forests by those who were interested in these difficult forest questions, would be most cheerfully undertaken.

Mr. Cox understood that the chief object of his attendance at the present meeting was to endeavour to answer such criticism as might be presented and to give any information which he could; but he thought that it would be convenient, before dealing with the questions on the agenda, if he endeavoured to give a general survey of the position and of the problems which were presented to the Forest Department.

The total area of Government forests in the Madras Presidency was between 18,000 and 19,000 square miles. Excluding, however, 1400 square miles which had been earmarked for management by village panchayats and were chiefly valuable for grazing, 440 square miles which had been, or were in process of being, disafforested for cultivation and other reasons, 13,000 square miles which comprised the main hill forests of the Presidency, there was left an area of from 3,000 to 4,000 square miles in close proximity to the villages and to cultivation, from which the bulk of the villagers' demands in respect of small timber and poles for house-building, firewood, thorns for fencing, leaf manure and grazing had to be met. This area was under systematic managements, by the Forest Department for the supply of village requirements, and it was in connexion with the Forest Department's management of this area, that the great majority of complaints were made.

Mr. Cox stated that the first question which arose was whether this area was sufficient in itself to meet all the daily requirements of a vast agricultural population, taking these requirements to be such as he had already specified. He was emphatically of opinion that the area was totally insufficient to do so. When these forests were reserved under the Forest Act 30 or 40 years ago, it was thought that a large portion of the village requirements, especially small timber, firewood and grazing, would be met from the large areas of waste forest land and poramboke which were purposely left out of reservation; and it was not anticipated, as has since proved to be the fact, that practically the whole of the forest on this class of land would be swept out of existence in 20 or 30 years. It was also anticipated that forest on private land would play a much larger part in the supply; but by improvident management much of this class of forest also had been destroyed. The result had been that the demands on the Government reserves, which were heavy at the start, had been getting heavier every year and would no doubt get steadily heavier as years go by with the increase of cultivation of population and of cattle.

The second point which Mr. Cox desired to emphasize very strongly was the extremely slow growth of forest in all conditions, and especially on the dry rocky hill sides which constituted the greater part of the area in question. Experience gained during the last 30 years showed that the annual incremental growth of this class of forest very seldom reached half a ton during the year even allowing for the weight of small twigs and foliage. That meant to say that if one obtained by clear felling a yield of ten tons an acre, one had to wait at least twenty years before a similar yield could be obtained again.

Villagers who saw from day to day the forest-clad slopes of the hills near their village and thought how much the village fields would benefit if all that growth were used as a soil fertiliser or for some other immediate purpose failed to realize, or if they realized it were indifferent to, the fact that it would take twenty years after cutting down the forest to replace it.

For this very poor rate of increase in growth it is fair to ask whether the Forest Department is not to blame and whether by more scientific and capable management, a much larger and quicker return could not be produced. The answer was that under present conditions there is very little possibility of increasing the yield.

In the first place, it must be remembered that when the Forest Department took over these forests thirty years ago, they were then in most cases in a very degraded condition in consequence of want of protection from over-grazing, goat browsing and unregulated fellings. Secondly, as shown above, the demands since reservation had been steadily increasing year by year and no opportunity had been provided to give the forests that period of rest and recuperation which is necessary to secure a permanent increase in their productivity. Any one will understand that so long as you are spending the whole of your income, you cannot build up your capital.

Thirdly, there is no known means by which you can grow a really valuable forest on a really bad soil, and if the yield from these forests could be increased up to three-fourths of a ton per acre per annum, that is about as much as one could reasonably expect.

Mr. Cox pointed out that there seems to be a general misapprehension about the yield which the forest is capable of giving. Even in the finest evergreen forests on the West Coast, with trees upwards of 150 feet in height it has been found by valuation that the total incremental growth seldom exceeds two tons per acre per annum, and this too on a magnificent soil with a rainfall of over 150 inches.

Once it is admitted that forest growth is always slow and is especially slow on the dry hills of Southern India, the conclusion is forced on one that even by the most careful management, it is totally impossible to supply all the demands of the vast agricultural population, and the real question is which of the many demands are to be met and which of them are to be refused.

One of the greatest demands made upon these forests is that of grazing on which Mr. Cox made the following observations. The custom, universal in South India, of herding cattle and sheep into a forest which is also to supply timber and fuel, is one unknown in any country where forestry has long been practised. In such countries as France and Germany, the forests are closed to grazing except in certain cases where pigs are admitted for short periods to feed on the fallen beechmast and acorns. It is generally recognized in such countries that the practice of forest grazing cannot be combined with the growth of wood; but in

Madras Presidency the number of sheep and cattle grazed in the Government forests is no less than 2¼ millions. It has to be admitted that this grazing is injurious to the forest. Not only do cattle injure the forest by trampling down young growth and browsing on tender shoots, but they are responsible for two other forms of damage which are often worse.

The first of these is the practice of lopping the branches and even the tops of forest trees in order to feed the cattle on the leaves. Instances of this practice can be seen on an enormous scale in the Guntur district where many thousands of acres of valuable Hardwickia forests have been destroyed.

The second of these injuries is that of fire, caused by the graziers burning the dry grass in order to obtain an early crop of fresh grass with the first rains. This evil is common to nearly all the forests of the Presidency, and the damage which is done is incalculable, so much so that hundreds of square miles of forest in districts like Cuddapah and Kurnool cannot now produce a single piece of sound timber.

Mr. Cox also desired to point out another factor with regard to forest grazing in general. The cattle driven to the forest are generally the worst which the village possessed. Certain investigations have shown that only 30 per cent of the cattle grazing in the forest were of immediate use for agricultural purposes beyond that of producing manure when driven to their penns at nights. The rest are mostly young stock, barren cows, worn out bullocks and animals too useless to be put under yoke. There can be no doubt that the whole system of forest grazing is prejudicial to the welfare of the general breed of the cattle. Where there is no forest grazing, the best cattle are to be found, as for instance in the Ongole taluk and the central parts of Coimbatore. It is not clear therefore that forest grazing is either absolutely necessary or desirable in the interests of the agricultural population themselves, although there may be individual cases where such a practice is desirable. However that might be, Mr. Cox considered that it would be clear to any one who examined the subject with an unprejudiced mind that the benefit which accrued from allowing the grazing of large herds of cattle in forests which were already heavily taxed in other respects did not compensate for the injury done to the growth of wood and fuel.

Another very large demand made on the forests in certain districts is that for green manure. Experiments which have been made by the Forest Department show that it takes about five acres of well-stocked village forest to supply enough green manure for one acre of wet cultivation and that the forest can only supply this amount once in about five years. The experiments are incomplete except in one or two districts and are still being carried on, but it is extremely unlikely that they will show large variation one way or the other in the above yield. If these figures are applied to a large area of wet cultivation, such as that of the Periyar Scheme with its ayacut of 160,000 acres of wet land, it is seen that it will take more than 600,000 acres of forest to supply the whole area with green manure for one year and that three million acres or about 4,000 square miles of forest would be required to keep that same area permanently supplied with green manure. It is therfore obvious that, at the best, the Government forest can only supply a very small fraction of the demand; and it would seem very much better that the ryots should learn to grow green manure on their own land. It is understood from the Agricultural Department that a single acre of cultivated land will provide sufficient green manure not only for the acre it grows on, but for perhaps another acre in addition.

In stating these facts Mr. Cox did not wish to suggest that there should be any sudden withdrawal of the facilities now given to the ryot for grazing their cattle or for obtaining green manure from the reserved forests. What he wished to suggest was that it is time that the people of the Madras Presidency should realize that the forests cannot possibly meet all the demands which are made upon them and that it must be decided which of the various demands on the individual forest should have preference. He believed himself that it would be greatly to the benefit of the country as a whole, if the ryots would learn to supply their own needs from the village land in the matter of grazing and green manure, while looking to the forests for their supplies of wood and fuel. He quite agreed that more might be done to develop the resources of the more distant forests and to supply timber and bamboos to the villagers in increasing quantities. It was hoped that a more active policy in opening up the forests with communications would be possible, now that the war had ended; but it had at the same time to be recognized that unless the produce obtained from the more distant forests was of considerable intrinsic value, the cost of carting made it prohibitively expensive.

The Chief Conservator also desired to say a few words about the retention by the Forest Department of lands which seemed to be more suitable for the cultivation of food crops than for the growth of forest. The policy of Government was that no land suitable for permanent cultivation should ordinarily be retained under forest. There were of course certain exceptions which he need not go into; but speaking generally, he thought that all reasonable demands for disafforestation on this account were being fully met. In fact since 1914-15 no less than 197,004 acres of forest had been disafforested of which more than half is fit for permanent cultivation. A further area of 85,000 acres had also been earmarked for this purpose, but it should be noted that there was often considerable delay in bringing land under cultivation subsequent to disafforestation. The forest had to be cleared away, the stumps removed and so forth. It might also be noted that in certain localities where a demand had arisen for the disafforestation of reserves for the benefit of cultivation, the village account showed very large areas of waste land already uncultivated.

While a large area of forest has already been disafforested and while more is to be disafforested in the future, little has been done in the way of afforestation. The chief reason was that afforestation except on really good soil was an extremely expensive undertaking; and it was doubtful whether Government were justified in spending large sums of public money for the purpose, so long as the existing forests by more careful management could supply the more important demands of the people. A possible exception was the case of casuarina planting in localities where there was already great scarcity of fuel, and this matter was engaging the attention of the Chief Conservator at the present time with a view not perhaps so much to increase the area of Government forests as to induce private owners to come forward and utilize part of their land for firewood plantations, as they have already done on a large scale in the districts round Madras.

A discussion on the various points of Mr. Cox's statement followed A suggestion was made that different forests should be set apart to meet different demands, i. e., one forest should be used for the production of timber and firewood, another forest should be used for grazing and a third forest for the production of green manure, on the ground that if each forest was managed for a single object a larger yield would be obtained.

Mr. Cox pointed out that the practical difficulty of giving effect to this proposal was that each village in the nighbourhood of a reserved forest wanted all kinds of forest produce. For instance, it the villagers of Melur and Alwarpet have been accustomed to get timber, fuel, green manure, thorns and grazing from the forest adjoinings the village, there would be an immediate complaint if the villagers of Melur were told to go ten miles to the Alwarpet forest to obtain their grazing while villagers of Alwarpet were asked to go ten miles to Melur to obtain their poles and fuel.

On the whole, Mr. Cox considered that conservation of the water supply, the prevention of silting of tanks, streams and irrigation channels and the supply of fuel and timber, must be recognized as the chief duties and objects of the Forest Department.

Mr. Sundara Reddi doubted whether the lopping of branches of trees to obtain manure was in itself injurious to the tree growth and stated that the villagers of South Arcot considered that it was beneficial to the trees of certain species. The Chief Conservator pointed out that although it was possible in the case of certain trees, especially if they grew on good soil, that careful lopping might be carried out without permanent injury, it was quite another matter to allow the villagers to go into the forest themselves and to lop the growth without any supervision.

Mr. Sundara Reddi agreed that the best and most economically sound practice was for the ryot to grow green manure on his own lands, but he stated that there were often difficulties in the way. Mr Cox admitted that there were no doubt considerable difficulties, and instanced the case of the ryots in the Salem district who had pointed out to him that the water available for irrigation scarcely sufficed them for a single crop of paddy and left nothing available by which to grow irrigated crops of leaf manure.

Mr. Sampson of the Agricultural Department who was present at the meeting said that the ryots in many villages have learnt to overcome the difficulty by sowing seeds of a green manure crop (daincha) along with the cumbu which they grow as a first crop on the wet land commanded by wells. After the cumbu has been harvested, the green manure crop is ploughed into the soil. The only trouble is that being a north-east monsoon tract, there is no certainly when water will be received for ploughing in the crop.

— Extracted from Publicity Bureau leaflet No. 10,214,000 — 10—9—20.

The Forest Department and Grazing in Nellore.

KANCHA CONFERENCE.

The kancha system described in a former note has now been in force for some years throughout Nellore. A conference met at Nellore at the beginning of this year to consider the working ot this system. The Chief Conservator of Forests Mr. Cox, the Collector of the district, the Director of Agriculture, the Forest Officers of the district and about 40 ryots attended the conference. The conference made the following suggestions :—

(1) At present the Forest department is trying to produce both fuel and grass for grazing from all forests. The conference suggested that certain forests should be set apart for producing fuel alone and that other forests should be set apart for grazing alone. It was also suggested that the Forest department should endeavour to improve the grazing on the kanchas by rooting out useless bushes and sowing seeds of good kinds of grass. It was agreed that the Agricultural department should advise as to the best kind of grass to be sown. The Agricultural department is about to establish a farm for cattle-breeding at Chintaladavi,

At this farm the Agricultural department can make experiments to find out which grass will grow most freely and which are the best for the cattle.

(2) The cattle which are grazed in certain kanchas come from the neighbouring villages. In other kanchas the cattle belong to rich men who send them from the distant wet land village near the coast. The kanchas in which the cattle of neighbouring villages graze are called 'local kanchas' and the kanchas to which cattle come from distant and delta taluks are called 'foreign kanchas.' The conference considered that the foreign kanchas might be leased in auction each year as at present. But the local kanchas should first be offered to the villagers for the sum at which they were leased in previous years If the villagers or the representatives of the villages are unwilling to take the kancha for this sum, then they should be sold in auction.

(3) The Forest officers were anxious to persuade the villagers to take the kanchas on lease not for a single year but for a large number of years, say for ten years. They hoped that, if the villagers would do so, they would be more careful to protect the grass and improve the grazing. They pointed out that there are in Nellore many grazing grounds owned by private individuals. The owners protect these grazing grounds carefully. As a result these grazing grounds yield far more grass than the forest grazing grounds. But the majority of the villagers were unwilling to agree to take lease for ten years. Some of them were willing to take lease for three or five years. They all agreed that the present system of leasing for one year only was bad. It was agreed that, if the villagers are to take lease for three or five years they should give some security for the proper management of the kancha. The conference decided that the District Forest officer should try to make arrangements with the villagers in each case to let out the kanchas

for as long periods as possible and should take some security for the proper management of the kanchas. If this is done, the conference considered that it would not be necessary for the Forest department to make rules directing that the kanchas should be closed for such and such months or that the number of cattle should be limited to such and such a number. For the person who has leased the kancha for a number of years will himself be anxious to improve the grazing and he will himself see that cattle are not allowed to spoil the grazing ground. It was also agreed that, if any one took the kancha on lease for a number of years, loans might be granted to him in order to enable him to improve the grazing.

Mr. Audinarayana Reddi offered to take South Mopur kancha on a long lease. He undertook to try and form a panchayat for the management of this kancha. He agreed that, if he failed to form a panchayat, he would take the lease in his own name and work the kancha in the interest of the village. The conference decided that the District Forest officer should accept this offer.

(4) Under the present system the kanchas are leased for one year only. The kanchadar who takes the lease of the kancha from the 1st of May is required to protect the kancha from the 1st of May till the 1st of October. It is only after the 1st of October that he can begin to allow the cattle to graze upon it. The kanchadar is required to be responsible to protect the kancha before the grazing season begins. It is no use to ask him to protect the kancha after he has made his profit by collecting fees from other cattle owners. Sometimes no one is willing to lease the kancha before the 1st of May. In that case the Forest department raises the minimum price fixed for the lease of the kancha. These arrangements were discussed at the conference and it was generally agreed that they were necessary. But the Forest department agreed

that, if a kanchadar buys a kancha late, they will not raise the minimum price fixed as high as they formerly did.

(5) Should the Forest subordinates interfere with the kanchas? This is a very important question. Some years ago when the Forest department first attempted to extend the kancha system, they issued orders prohibiting Forest subordinates from interfering with the kanchas at all. But the effect of this was bad. The kanchadars were not able or did not care to compel the villagers to act according to the rules laid down. They allowed all cattle without restriction to enter the kanchas and they allowed them to enter when the grass was young. The kanchas therefore began to deteriorate and it was necessary to direct the Forest officers again to supervise and assist the kanchadars.

The conference generally agreed that it was desirable that the forest guards should not interfere too much with the kanchadars; but it was also agreed that the help of the forest guards is necessary to kanchadars to prevent the villagers from using the kanchas without the consent of the kanchadars. Mr. Krishnaswami Rao, President of the kavali forest panchayat, said that his own panchayat was able to manage its forest without the assistance of forest guards. But he thought that there were other badly managed kanchas and panchayats who required the supervision and assistance of officers of the Forest department. The conference thought that it was desirable that there should be more officers of some status such as foresters to assist and control the kanchadar. But till there are more foresters it will be necessary for the forest guards to pay attention to the kanchas.

(6) The conference then considered the complaints of certain ryots who objected to the kancha system. The principal complaint was that the kanchadars charge very heavy fees for the animals which graze in the kanchas. It was said they asked as much as Re. 1 or Rs. 1-8-0

per animal. Again some kanchadars complained that they were too severely fined for the mistakes in the management of their kanchas. The ryots apparently wished to go back to the old permit system. Under that system any ryot could get a permit to graze his cattle at any time of the year for a small fee. However many cattle were sent on to the grazing ground, no one made any objection. The conference was generally of opinion that the kancha system is better than the permit system. Under the kancha system the grazing grounds are likely to improve because the cattle are kept away when the grass is young and because too many cattle are not allowed to enter the grazing grounds. Under the permit system the grazing grounds cannot be improved. The conference therefore wished the kancha system to continue.

(7) The conference pointed out that it was desirable that the District Forest officer should have power to alter the rules for the management of kanchas to suit each particular kancha and that it was necessary that he should be in constant communication with the ryots so that he may be able to understand each difficulty as it arose.

The Hon'ble Mr. Cox, Chief Conservator of Forests, was himself present at the Conference In submitting the proceedings of the conference to Government he has expressed the following views which have been approved by Government.

He points out that it is impossible to produce fuel and grass in abundance on the same lands. He agrees with the conference that as far as possible certain forests should be set apart for producing firewood where at least 21 forest reserves in Nellore might be set apart for grazing only. If this is done it will be necessary to protect more strictly the forests which are set apart for producing firewood. At the same time it will be necessary, as proposed by the conference, to do more to improve the growth of the grass in the grazing reserves.

He agrees with the conference that the villagers should be allowed to lease local kanchas without auction at a mamool rate.

He agrees also that it is desirable wherever possible to induce the kanchadar to lease kanchas for several years instead of one year only.

He points out that it was satisfactory to find that the conference had few complaints to make against the forest staff and that the majority of the villagers and the kanchadars present at the conference desired that the forest guards and watchers should continue to protect the kanchas.

Mr. Cox explains that it would be a mistake to suppose that even in Nellore the majority of the people approve of the kancha system. The more intelligent villagers and those who own good cattle no doubt see the advantages of the kancha system. But the ordinary villager even in Nellore thinks first that grazing should be cheap without considering whether the grazing is likely to be good.

Mr. Cox finally draws attention to the following facts which were explained to the conference by the Director of Agriculture.

It is probably true that the kancha system of grazing cattle is better than the system in force in other districts of the Presidency. But the chief reason why it was possible to extend the kancha system in Nellore district is this. The number of people in the Nellore district is small and there are large areas of cultivable waste lands. In other districts such lands have long since come under cultivation. In no other district are so much of the reserve forest lands fit for cultivation. The Director of Agriculture said that it is desirable that much of the land in Nellore which is now reserved for grazing should at some future time be assigned to the ryots for cultivation. This land is fit to produce more than the jungle grass. Each landholder should learn to do without special grazing grounds. He should learn to grow upon his own lands along with his food crops the fodder required for the cattle that work on his lands. This is not an impossible thing. Even in Nellore district in the northern taluks fine Ongole and Kangayam cattle are bred. In these tracts there are neither forest reserves nor private grazing grounds and all cattle are stall-fed.

Mr. Cox states that the conference fully accepted the Director of Agriculture's views. They agreed the grazing of cattle on public grazing grounds even under the kancha system is not the best arrangement, so long as the cattle are allowed to graze on common grazing grounds. The breed of cattle is likely to deteriorate and the ryots will be tempted to keep a large number of inferior cattle for the sake of their manure and their hides. This is ruinous to the country. At the same time it will be many years before the ryots are ready to cultivate all the kanchas in Nellore which are now reserved for grazing. The conference considered that in the meantime it was desirable to reserve these forest grazing grounds for the benefit of the cattle of better quality. If this is done the ryots will be encouraged to breed better cattle.

—Extracted from Publicity Bureau leaflet No. 90—10,900—
10—8—20.

Forest Vernacular Training School.

NORTH CUDDAPAH DIVISION.

The Annual Session of the Vernacular Training School for Foresters and Forest Guards of the Central Circle was held during the current year in North Cuddapah Division. The choice was a happy one as the division afforded a very suitable training ground for the students whereby they had opportunities of seeing the fine forests of Red Sanders (*Pterocarpus Santalinus*), yepi (*Hardwickia binata*), and Yelama (*Anogeissus latifolia*) of the Central Circle as well as the very poor forests with little or no tree growth worth the name

The staff consisted of Messrs. S. Chinnathorai Pillai B A., Ranger II grade, as Senior Instructor and S. Ramachandra Ayyar, Ranger III grade as Junior Instructor. A scheme of instruction was drawn up on various subjects, and advantage was taken of the sanctioned works in progress in the several ranges for field-work Special attention was paid to the development of the 'forest eye' by making the students observe during excursions the forest characters of trees, nature of soil and habits of wild animals from the point of their utility to the forest. Training was also given to develop the power of resourcefulness in all they would be required to do, and also to use common sense as their best guide. In short all the aspects of a Forester's, and Forest Guard's duties were placed before them. The following is a resume of the various subjects taught, and the works done.

1. *Sylviculture and Botany*:— The utility of forests in conserving the sources of water supply and the prevention of erosion and landslips were explained, and typical examples of the effect of the latter were practically studied during excursions. The habitat of the chief species, the time of their flowering, and seeding, the method of regeneration were also studied. The different systems of working for timber, and fuel as adopted in the Circle, the main differences between Improvement fellings, simple coppice and coppice with standards were taught and practical work was done in the coupes under working. The work of the coupe contractors was also explained.

2. *Artificial regeneration* :—Practical instruction was given in the propagation of sandal which is being carried on in the division. The stdents dibbled seeds in three localities in the Lankamalais, and tended the existing plants in the Nallamalais, and Lankamalais. Concentrated regeneration by dibbling seeds of other species as *Melia indica* and *Hardwickia binata* was done in a Rest house compound. The 'tangedu' (*Cassia auriculata*) plantation at Kodur was also studied.

3. *Demarcation* :— The method of permanently demarcating reserved forests adopted in the circle was studied practically. The method consists in clearing boundry lines, 12 feet wide, and constructing cairns at every bend and at every two hundred yards and connecting them by a line of stones 2 feet wide, or by trenches wherever stones are not available. Each cairn bears a stone slab-- on which "R. F." and the number of cairn were chisselled, the 'R. F.' facing outside. Demarcation of coupes by planting coupe stones was also done.

4. *Protection of forests* :— The various forms of damages done to the forest by fire, man, and cattle, and the responsibilities of the Foresters and Forest Guards in reducing the above by constant and vigilant patrol and by doing their work honestly were explained to them. As regards fire protection the methods adopted for the prevention and spread of fire by maintaining firelines and patrols were studied practically. 25 chains of fire lines were cut and cleared, and 8¾ miles in the Lankamalais were fire traced by burning. The willing co-operation of the villagers was pointed out to be the most important, and effective measure as well as the duties of villagers living in the vicinity of forests under Section 23 of the Forest Act were impressed on their minds. The different methods of putting out fires were studied practically and the students actually put out

4 fires in the Nallamalais, and one in the Lankamalais of which one in the Nallamalais was done by counterfiring. The students observed this fire in the afternoon while engaged in the construction of a bund, and immediately proceeded to the scene of fire which was proceeding at a tremendous rate over a length of about 3 miles. They worked at it, the whole night, put it out completely by next morning. and returned to camp only at 11 A. M. The work is very commendable especially at a time when the heat of Cuddapah was very trying.

5. ***Charcoal burning*** :— While camping in the Nallamalai, the students felled and billetted 250 c. ft. fuel, and prepared a paraboloidal kiln. The burning was regulated for about five days, and good charcoal was obtained. Advantages of charcoal over wood-fuel were also explained to them.

6. *Road works* :— Principles of road construction were taught practically. An approach road of 10¼ chains to a Rest house in the Lankamalais was constructed with a gradient of 1 in 20. In the Nallamalais 7 chains of new road was constructed. Four Irish bridges were constructed at different camps. In the Lankamalais 3 furlongs of ordinary repairs was done. The total work done under road making briefly is :—

22¾ chains clearing jungle, and uprooting stumps,
19250 c. ft. of earth work,
1035 ,, of breaking rocks,
1930 ,, of revetment,
2186 ,, of stone paving,
7 chains picking stones,
100 c. ft. of grevelling, wetting and tamping,
26 chains sectioning,
and, 3 furlongs ordinary repairs.

7. *Survey*:— The students were trained in aligning straight lines, measuring with chains, taking offsets, and right angles with the cross staffs. Chain, and prismatic survey were also practically taught. One coupe, and one enclosure were surveyed and plotted. The use of the Ghat tracer in aligning roads was also taught to select students.

8. *Building works* :— The preparation of bricks studied at a private manufacturing site, and that of lime was done by the students themselves. Advantage was taken of the construction of a subordinate's quarters near Nallamalais which had been commenced. The students prepared 500 c. ft. of concrete for the foundation, and constructed 100 c. ft. of masonry with stone in lime.

9. *Well digging* :— The construction of a well in a Rest house near Nallamalais was availed of for practical instruction. Blasting was done with country gun powder and dynamite. 500 c. ft. of silt was also removed from a well near Lankamalais.

10. *Stone walling*: — In Cuddapah Dn. the Improvement coupes are protected from fire, and cattle by stone walls all round. They are constructed as the felling progresses and are 3½ feet high, 3 feet wide at the bottom and 1½ feet at the top. 5 chains of walling was done by the students round one coupe in the Nallamalais, and one in the Lankamalais.

11. *Bunding streams* :— The object of bunding and the method of construction were practically taught. The students constructed 5 bunds across streams in the Nallamalais totalling 2508 c. ft. of stone work.

12. *Hay making* :— Opportunity was taken of the operations done by the Military department in the Lankamalais to study

the principles of hay making, and the method of pressing hay, and the parts of a hay press.

13. *Rain gauge*:— The differential rain gauges kept in Nallamalais were read, recorded, and reset.

14. *Control of labour*:— A clear knowledge of every work its proper distribution, and allotment to each labourer coupled with personal supervision, and last but not least prompt payments were impressed on the students.

15. *Mensuration*:— The works turned out by the students were measured, their cubic contents calculated, and recorded in the measurement book. The necessity and importance of maintaining the latter for all departmental works were taught.

16. *Accounts*:— Preparation of advance, and work, vouchers, muster roll, invoices, forms 37 and 38, preparation and maintenance of depot registers for timber, and other produce collected departmentally were taught. Special stress was laid on the prohibition by Government of the collection of any revenue by the Foresters and Forest Guards.

17. *Law*:— The Madras Forest Act, and the rules under Section 26 were taught in detail with the aid of Mr. Maduranayagam Pillai's manuel in telugu. The various kinds of forest offences of almost daily occurrence were pointed out and the procedure to be adopted in the preparation of offence reports, collection of evidence, and conducting prosecution was explained to them. Sham Courts were held on Sundays to give the students a practical knowledge of the details taught.

18. *Duties of Foresters and Forest Guards* :— The general and special duties which they have to remember as well as their duties towards the public, and their responsibilities as regards Govt. Stores were impressed on their minds.

19. *Drill, and games* :— The students had drill almost daily and were given road marches as opportunity afforded. Contrary to the usual practice, a new departure was made in having Hockey as compulsory game instead of football. On account of the materials having arrived late, the game was commenced only in April that is in the third month of their course. Four matches were played with the Cuddapah Reserve Police and the results are as follows :—

	School.	Police.	Result.
26—6—20	2	5	lost.
21—7—20	1	5	do.
2—7—20	4	1	Won.
30—7—20	3	2	Won.

The results are eminently satisfactory considering the fact that the school had only four months' practice. Two of the students in the team are men trained in the Indian Defence Force.

The health of the students on the whole was very satisfactory. As regards conduct and discipline, a set of disciplinary rules were framed on the lines of the Madras Forest College rules, and a House Committee was formed to supervise transport of samans, camp arrangements, preparation of Hockey, and Drill grounds, and for enforcing discipline among the servants of students. The conduct of the students was on the whole good. To promote social amenities moonlight parties were arranged once a month in which the local

Range officers took an active part. On Sundays the students rehearsed 'Kananaprahasanam' a drama in Telugu, compiled by Mr. V. N. Seshagiri Rao, Extra Asst. conservator, explaining the aims of Forest conservancy, and acted the same at various places in the presence of the ryot population, and finally at the dramatic pandal at Cuddapah on the 30th July, at which the elite of the town including the Collector, and other officials were present. The drama was much appreciated.

Of the 25 students who passed through the course 12 were given first class certificates, and 13 second class certificates. On the last day, i. e. on the 31st of July, sports were held in the Police parade ground under the presidency of the Collector, and certificates, and prizes were distributed. On the 27th a Marathon Race was run over a distance of 6 miles, and Chinna Narayana, a student from Guntur won it in 41 minutes. Substantial prizes were given in the shape of cups and medals. Mr. Chinnathorai read out to the public a summary of the training given to the students, and Mr. J. A. Master, D. F. O. S. Cuddapah in a brief speech referred to the aims of the Forest Department, and invited the people to co-operate with the Govt. in successfully carrying out the administration of their gratest national asset, viz, 'Forests'.

Thus ended a successful course of training the credit of which is due to Messrs. Chinnathorai, and Ramachandra Ayyar. Both of them had distinguished careers at the Madras Forest College. Mr. Chinnathorai has presented to the College library, a group photo of the Vernacular Training School Students and staff.

M. R. SUNDARAM AYYAR.

Students' Club Fund.

Statement showing amounts received since 1—9—1920 towards the Students' Club fund, from old students.

	Rs.	A.	P.
Mr. P. A. Krishnaswamy Mudaliar	5	0	0
,, M. B. Subbayya ...	2	0	0
,, S. Nagalingam Pillai ...	84	0	0
,, Syed Manavaa ...	15	0	0
,, K. S. Ramiah ...	10	0	0

Statement showing amounts promised and still due by old students.

	Rs.	A.	P.
Mr. C. S. Ramanathan	10	14	0
,, M. R. Doraiswami	3	0	0
,, Kerala Varma	10	0	0
,, C. M. Kunhiraman Nair	5	0	0
,, Gulam Dustagir	9	0	0
,, S A. Dawson	11	0	0
,, N. T. Tambi	4	0	0
,, P. Karunakara Menon	9	0	0
,, Dhananjeya Rao	13	0	0
,, Kesava Pillai	12	0	0
,, I. Ramalingam	8	0	0
,, L. A. Krishna Ayyar	7	0	0
,, S. Krishna Ayyangar	15	0	0
,, T. K. Parameswaram Pillai	15	0	0

	Rs.	A.	P.
Mr. P. Krishnan	10	0	0
,, T. E. Varadhachari	15	0	0
,, K.G. Sundararaja Rao	10	0	0
,, K. G. Sreenivasa Rao	10	0	0
,, M. Krishna Ayyar	10	0	0
,, S. V. Sigbhatullahi	10	0	0
,, Gulam Rassool	10	0	0
,, T. R. Naganatham	10	0	0
,, W. Balakrishna Mudaliar	10	0	0
,, Aiyappa Asari	15	0	0
,, D. Patel	18	0	0
,, K. Jayaraman	12	0	0
,, P. V. Ramanna Rao	12	0	0
,, R. E. Lemos	50	0	0
,, B. V. Nagaraja Ayyar	10	0	0

List of contributions to the Gass Museum from 6—9—20 to 20—11—20.

Serial No.	Contribution.	Contributor.
1	Two snakes : (i) *Lachesis* (*Trimeresurus*) *Anamallensis.* (ii) *Lycodon travancoricus.*	C. E. C. Fischer Esq. I. F. S.
2	(a) Seeds of : (i) *Myristica canarica* (ii) *Bambusa arundinacea* (iii) *Artocarpus hirsuta.* (b) Crude candle made out of the pulp of *Myristica canarica.* (c) Fruits of : (i) *Dipterocarpus indicus* (ii) *Hopea parviflora* (iii) *Dysoxylum glandulosum.*	M. R. Ry. Rao Sahib K. R. Venkatramanier Avl E. D. C. Sylviculturist.
3	One root stump and seven billets of the trunk of a big sandal tree 7½ ft. in girth, from Namakkal Range (the billets weighing on the whole 86 qrs, 8 lbs.)	H. A. Latham Esq. I. F. S.
4	A large number of botanical specimens.	A. W. Lushington Esq. C. I. E.
5	Six samples of Para rubber.	F. R. Vincent Esq. Planter; Kutikul Estate Mundakayam. Travancore Dt.

Serial No.	Contribution.	Contributor.
6	The skin of one "Hamadryad" or "King Cobra".	C. R. T. Congreve Esq. Castlecroft Estate; Anamalais
7	One long panel of *Bassia latifolia*.	F. A. Lodge Esq. I. F. S. C. I. E
8	Two bark samples.	M. R. Ry. P. Dhananjaya Rao R. O. Chendragiri.

Quarterly List of Books received for the Madras Forest College Library upto 20—11—20.

A. **General Library:—**

1. Forest Management (by *A. B. Recknagel & John Bently Esq.*)
2. Theory and practice of Working Plans (*by A. B. Recknagel* B. A. M. F.
3. Insect Life (*by J. H. Fabne*)
4 History and Derivation of English Language, (*by R. H. Allpress* M. A.)
5 Research Defence Society; Quarterly Report; July 1920.
6. Note on the Geotropic curvature of the inflorescence in *Eichorria, Kunth* (water Hyacinth).
7. Forestry and Agriculture
8. Miscellaneous Notes No. XVIII An anomaly in floral biology.
9. More trees for farms (*by P. S. Jeevanna Rao M. A.*)
10. The Russo-Japanese War on land (*by Cap. F. R. Sedgewick.*)
Presented by H. C. Bennett Esq. I. F. S.

11. Notes on the life of Stonewall Jackson (*by J. R. Anderson*) Presented by H. C. Bennett, Esq. I. F S.
12. A Midsummer drive though the Pyrennes (*by Edvin A. Dix,* M. A.) Presented by H. C Bennet Esq I. F. S.
13. Wellington's Campaigns 1805—15 (*by Major General Robinson* C. B.) Presented by H. C Bennet Esq I F. S.
14. Twelve Indian Statesmen (*by George Smith* C. I. E. L.L.D.) Presented by H C. Bennet Esq. I. F, S.
15. Aircraft (*by Thomas W- Corhin*) Presented by H. C. Bennett Esq. I. F- S.
16. The Great War; 8 copies (*by Edward Right*) Presented by H C Bennett Esq I. F. S.
17. Report of The Agri-Horticultural Society of Madras for 1917.
18. Report of The Agri-Horticultural Society of Madras for 1917.
19. Proc of the Agri Horticulture Society of Madras January to March 1919—20.
20. Bungalow book at Parappa (Presented by The Conservator of Forests W. C.)
21. Forest Bulletin No 39. Note on Hollong timber.
22 International Review of the Science and Practice of Agriculture; April 1919.
23. Burma Forest School Pyinmana Calender 1919—20.
24. A Historical Study of Forest ecology; its development in the fields of Botany and Forestry (*by Dr. R. H Boerker*)
25. Ecological investigations upon the Germination and early growth of Forest trees.
26. Chemical Services Committee 1920.
27. Proc. of Govt of Bombay November 1919.
28. Administration Report of Travancore Forest Dept for the year 1094 M. E. 1920.
29. Annual Progress Report on Forest Administration in the Presidency of Bengal for 1918—19.
30. Forestry in the United Kingdom (*by W. Schlich P. H. D*)

B. Students' Library.

1. Journal of Bombay Natural History Society. 36 numbers.
   (*presented by H. C. Bennett Esq.*)
2. Memorandum issued by the Executive Committee of the British Labour Party in reply to appeals from Indian Moslems for a statement of policy on the question of the Turkish settlement.

Miscellanea.

I. *Influence of Earth-worms.*

"The food of earthworms is human matter; to obtain this, they have to assimilate large quantities of earth which is obtained from the subsoil, and contains, generally, only about one per cent or less of humus. The earth, while passing through the alimentary canal of the worm, is subjected to the action of its digestive juices, which dissolve out the humus and render the mineral particles more soluable to the carbonic acid water of the soil It is then excreted at the surface of the ground during or after rain.

Darwin calculated from actual observation that in humid climates, in a soil fairly stocked with these worms, the earth thus brought up may amount from one-tenth to two-tenths of an inch annually over the entire surface. He further estimated that in this manner ten tons of dry earth per acre, annually pass through the bodies of earthworms and are brought to the surface.

Apart from the mechanical effect worms achieve in loosening the soil the entering of air and water in their burrows, and the chemical effects arising from the digestive process and the final return of their own substance to the soil are of great value. Their habit of drawing, after themselves leafstalks, blades of grass, and other vegetable remains into their burrows, is another means of improving both the physical and chemical properties of land. The uniformity, lack of structure, and loose texture of the surface soil, especially of forests as compared with subsoil layers of corresponding thickness, is doubtless largely due to the work of worms.

Another important point is that in soil thrown up by earthworms, the humus formed under their influence is always of a neutral character and never acid. The work of earthworms is especially effective in loamy soils and in humid regions. In the arid regions of the earth, and in sandy soils generally, the life conditions are unfavourable to the worms, and the perviousness elsewhere brought about by their labours, already exists naturally in most cases.

It is stated by Mr. E. T. Seton (Century Magazine, June 1904) that the earthworm is practically non existent in the arid regions between the rocky mountains and the immediate Pacific coast from Manitoba to Texas; in the Pacific coast region however, it is abundant, and does its work effectively.

It has been calculated that an acre of ordinary agricultural land contains about 50,000 earthworms The effect of their combined labours in reducing the soil to a finer condition, as we have seen, is great, while they also enrich the surface soil in nitrogen. In old pastures, the production of a close compact sward is largely due to the fine earth which is brought to the surface by earthworms, to be afterwards crumbled down and levelled by the action of wind and sun.

When the earthworm casts are being constantly swept up and carried away from lawns, cricket grounds and putting greens, the surface soil gradually becomes exhausted of fertility, the grasses die out, and mosses take their place."—(*The Gardeners' Chronicle*)

— *C. P. Garudachala Mudaliar.*

* * *

II. Some aspects of Forest Administration, Madura.

Under the auspices of the Madura District People's Association, a lecture on "Some aspects of Forest Administration in Madura" was delivered by Mr. S. V. Devadason, District Forest Officer, Madura, on 21st October 1920, at the Madura College Hall. Mr. K. R. Venkatarama Iyer B. A., B. L., President of the Association occupied the Chair.

The lecturer at the outset said that His Excellency the Governor presiding at the annual prize-giving at the Forest College, Coimbatore in June last, said that public opinion in this country was developing very fast and that the tax-payer who paid for the services of the Forest Department had a right to know what was going on in that particular Department. He therefore advised all Forest Officers to get into the confidence of the people.

He gave a short account of the origin and history of the Forest Department in Madura and how the revenue gradually rose from Rs. 4,500 in 1865 to Rs 1,84,000 during the current, year. He said that in Forest Administration the object in view was two-fold.

1. To conserve and improve the forests.

2. To secure to the general tax-payer the greatest benefit from their commercial working.

Forest Administration, not only in Madura District, but in any district was beset with difficulties. It was a constant struggle against opposition in various forms.

As regards the question *of grazing* he said that it was one of the most important and difficult matters with which the Forest Department had to deal. Because strict regulation and limitation of grazing is absolutely necessary in the interests of the Forests themselves. For, excessive grazing must result in the majority of cases in the extermination of tree growth. Although the average incidence of grazing when the total area of the forest was taken into consideration, was not high it should be remembered that the open areas contain large tracts of forests to which cattle are not driven and so the actual grazing incidence was far heavier than what the forests can support. To deal satisfactorily with this demand was one of the chief problems of the Forest Department. Grazing had therefore to be regulated and its incidence reduced gradually both for the sake of the better class of cattle and in the interests of the fuel production.

As regards the question *of fuel*, in Madura District, it is one of supply to the urban population, there being not much difficulty for the rural population. He then spoke about various systems adopted in supplying fuel from the Government Forests. He spoke about the relative merits of the three systems—the permit system, the depot system and the contract system and said that the last system was the best of the three. The requirements of Madura Town in the matter of fuel supply was estimated about 6,0000 tons per year. The supply from Government Forests in Madura was about 20,000 tons and that from Trichinopoly 11,000 tons. The remaining quantity of about 29,000 tons had to be obtained from private sources which where irregular and unprotected and therefore, it was gradually bound to decrease. When this shortage came, the price of fuel in Madura, was bound to rise very much high unless steps were taken in the meantime to meet the demand.

As regards *leaf manure*, he said that the custom of using forest leaves for the manuring of wet lands was an ancient one and that this custom of removing manure leaves may have done little harm when the extent of the forests was much greater and the value of their produce much less, than those were now, but it was far too wasteful and harmful to be continued under modern conditions of increasing cultivation and receding forests. The question should therefore be looked at not from the view of what the ryot does require, but rather from the view of what the forests can supply. He pointed out from facts and figures, that even if the valuable fuel forests of Madura were given up to no other purpose than the supply of green manure for the rice fields of the Periyar area, the supply will now be inadequate, meeting about only an eighth of the demand, even apart from the fact that owing to the harm done to the forests it will gradually or rapidly decrease every year until they are destroyed and then there will be no manure leaves and also no forests. He said that in that direction, efforts were made by the Agricultural Department to popularize other and more economic methods of green manuring than the application of forest leaves. He said that the method of raising green manure should spread all over the Periyar irrigated area and that our cultivators must either learn to grow green manure crops for themselves or must take to other manures such as, oil cake, fish guano etc. He said that fish guano was a very valuable fertilizer practically free from impurities and that at present almost the whole of the fish manure manufactured is exported even to Japan. This should not be the case, but that efforts should be made to encourage its use in the country itself.

There was an interesting discussion after the lecture.

—Extracted from the 'Madras Mail.'

III. " *The Empire Timber exhibition* " —*by Alexander L. Howard.*

" The Empire timber exhibition entailed an enormous amount of continuous hard work, and persistent energy which eventually resulted in bringing together a collection of many hundreds of timbers from every part of the Empire, and certainly the majority of those of any commercial importance.

The Indian Empire: The remarkable exhibit of the timbers of the Indian Empire both in the raw state and manufactured into furniture and so forth, was the more noteworthy when it is remembered that practically none of these timbers of India had ever before been seen in this country. Even those who were acquainted with the Forest wealth of India have not hitherto realised the extent of its commercial value in Europe. Amongst the exhibits were two halls and staircases made respectively in Indian Silver grey wood and padauk (*Pterocarpus dalbergioides*) a dining room panelled in gurjan (*Dipterocarpus turbinatus*) and furnished in laurel wood, a drawing room is Sissoo (*Dalbergia Sissoo*), a bed room in Indian black walnut with panels of walnut burr (*Juglans regia*) etc The great possibilities of the Indian timbers were perhaps most strikingly shown in the Railway coach built by the Great Eastern Railway Co.

In addition to these larger exhibits were shown chairs, mirrors, and numerous small articles which serve to illustrate the many and varied uses to which the woods may be put. Some two hundred small specimens showed the wide range of colour and texture which is available. Among this large collection of timbers the following are particularly worthy of the most careful attention of those interested in Timbers for decorative and constructional work. Gurjan (*Dipterocarpus turbinatus*), a pale brown coloured wood with a delicate aromatic scent is an attractive medium for panelling, and one of the best hardwoods for flooring, which it is possible to obtain. It is available in large sizes of superlative quality at a price which brings it within the range of even the most economical kinds of uses. Padauk is unique in its brilliant red to maroon colour. It is very firm and durable, and stands well without shrinking and warping. During the war immense quantities of padauk were used for saddle-trees, and gun carriages for which purposes it is difficult to find its equal It was also used for the felloes of some exceptionally large wheels for heavy guns for use in Russia. The produce of a species of *Canarium* which has been termed Indian white mahogany is likely to take an important place in the future. It is a smooth even-grained wood which will be available at a very reasonable price. *Adina Cordifolia* is a bright Canary-coloured wood notable for the smooth and even regularity of the grain. It is possible to carve it in any direction without splitting—a striking quality which gives it a particular value Perhaps the finest carving wood which it is possible to obtain, however, is Indian red pear (*Bursera Serrata*) which possesses the above quality in a unique degree . Of the woods which are chiefly notable for their decorated qualities the handsome striped and mottled ebony known as Andaman marble wood (*Diospyros Kurzii*) is one.

It becomes abundantly clear that the only thing necessary for these timbers of India to take the important position which their merits deserve is that the representatives of the Government in India should continue to provide regular and certain supplies, and to this end extensive arrangements are now being made.

* * *

—Extracted from "Nature" July 29, 1920.

Gazette Notifications.

7th September 1920.

1. Mr. A. A. F. Minchin, Deputy Conservator of Forests to act as Conservator of Forests in charge of Northern Circle during the absence of Mr. C. M. Hodgson on leave or until further orders.

2. Muhammad Saiyid-ud-din Sahib Bahadur E. A. C. to act as D. F. O. Ganjam during the absence of No. 1 on other duty.

3 Abdul Khalaq Sheriff, Forester I grade promoted to Ranger VII grade, *sub-pro-tem* from 1—10—1919 *vice* M. R. Ry. V. Narayana Ayyar on other duty.

4 W. E. Timasfieldt, Forester I grade to Ranger VII grade acting from 12—6—1920. *vice* M. Hussain Khan Sahib on deputation.

5. A. J. M. Snaize, Forester I grade to Ranger VII grade acting from 1—10—1919 *vicē* G. V. Subba Rao under training at the Madras Forest College.

6. S. Varadarajulu Reddi, Forester I grade to Ranger VII grade *sub-pro-tem* from 25—6—1920 to 11—7—1920 in permanent vacancy.

7. K Shaik Muhammad, Forester I grade to Ranger VII grade temporary from 1—6—20 to 18—6—20 in the post sanctioned for vernacular Training School.

8. D. V. Krishna Rao, Forester III grade to Ranger VII grade temporary from 1—2—1920 to 31—7—1920, in the post sanctioned for Vernacular Training School.

9. Abdul Razak, Forester I grade to Ranger VII grade *sub-protem* from 7—12—1919 to 2—4—1920 *vice* Mr. J. A. P. D'Cruz on other duty.

10 B. Venkayya Naidu, Forester I grade to Ranger VII grade *sub-protem* from 23—4—1920 to 11—7—1920.

11. G. V. Govindarajulu Naidu, Forester I grade to Ranger VII grade *Sub-protem* from 30—5—1920 to 25—10—1920 *vice* B. Gulam Dastagir Sahib temporarily reduced.

12. R. Madeira, Forester III grade to Ranger VII grade *sub.protem* from 23—6—1920 to 5—7—1920 in a permanent vacancy and acting from 6—7—1920 *vice* Ranger T. Srinivasachari, under suspension.

13. V. Parthasarathi Nayudu Forester II grade to Ranger VII grade *sub-protem* from 17—6—1920 to 11—7—1920.

14 M. R. Ry. S. Ramaswami Ayyar, Ranger I grade transferred from Godaveri Lower, to Kurnool West.

14th September 1920.

1. The privilege leave for one month granted to M. R. Ry. S. Ramachandra Ayyar Ranger III grade *sub-protem*, North Cuddapah district is extended by 5 days.

2. The privilege leave for 2 months and 15 days granted to M. R. Ry. A. Sidda Pillai Ranger IV grade in charge of Palnad Range, Guntur District is extended by 2 months.

3. The combined leave for 15 months from 27th March 1919 granted to Muhammad Asadulla Ghatala Sahib Ranger V grade Kurnool East is extended by 6 months.

4. Mr. A. B. Fenn, Ranger VI grade granted 2 months privilege leave on relief by Forester A. Kadir Badshah.

21st September 1920.

1. The combined privilege leave and furlough for 2 years already granted to Mr. C. D. McCarthy, Conservator of Forests will be cummuted into

(a) privilege leave for 3 months and 17 days.
(b) furlough on average Salary for 4 months and 13 days.
(c) furlough on half average salary for 1 year and 4 months.

2. Mr. C. M. Hodgson granted leave on medical advice, from 28—9—20 follows :—

(a) privilege leave for 6 months.
(b) furlough on average salary for 4 months.
(c) furlough on half average salary for 3 months.

3. Consequent on the rearrangement of Forest charges in the Southern Circle the following postings will have effect from 1—7—1920.

M. R. Ry. A. Raju Naickar Avl. to be D. F. O. Central Salem Division.
M. R. Ry. P. Venkataramana Ayyar Avl. to be D. F. O East Salem.
M. R. Ry. George Venugopal Avl. D. F. O. to be D. F. O. Trichinopoly (South Salem).

4. M. R. Ry. S. Ramachandra Ayyar, Ranger III grade on return from leave posted to Chamala Range, Chittoor District.

5. M. R. Ry. S. Chinnadorai Pillai Ranger II granted privilege leave for 6 weeks from 3—9—20.

6. Mr. T. V. Staggs Ranger II grade transferred from Kistna to Kurnool West and Mr. A. J. M. Snaize Ranger VII grade on relief to Kurnool West from Kistna.

28th September 1920.

1. Mr. H. Tireman, Conservator of Forests, granted an extension of furlough on average salary for one month.

2. M. R. Ry. B. V. Jogeswara Rao, Ranger VI grade granted privilege leave for 2 months from date of Relief.

3. Mr. L. J. Taylor Ranger III grade transferred from Santhavasal Range to Kodaikanal Range.

4. M. R. Ry. R Subramania Ayyar Ranger III grade transferred from Kodaikanal to Santhavasal Range.

5. M. R. Ry. P. A. Krishnaswami Mudaliar Ranger V grade granted extension of leave (privilege) for 6 weeks.

6. M. R. Ry. V. N. Seshagiri Rao Avargal E. A. C. on relief from North Vellore division by M. R. Ry. E. K. Krishnan Avl., posted to South Vellore to assist the D. F. O. pending further orders.

7. Mr. J. A. Aranha, Ranger V. Grade on return from leave on 21-10-1920 posted to the South Malabar for duty under the District Forest officer.

5th October 1920.

1. Mr. P. W. F. Walpole, E. A. C. granted privilege leave from 18-12-1919 to 1st February 1920 (inclusive).

2. M. R. Ry. P. Govinda Menon Avl. E. A. C. granted privilege leave for 1 month & 5 days from 5—10—1920.

3 M. R. Ry. T. S. Narayanaswami Chetti Ranger VII grade in charge of Sidhout range granted privilege leave for one month with effect from date of relief.

4. M. R. Ry. V. P. Narayana Menon Ranger IV grade in Badvel Range will relieve No. 3 and hold charge of the same temporarily.

5. M. R Ry S. Ramaswami Ayyar Ranger I grade Kurnool west granted privilege leave for 3 months and 13 days from date of relief.

6. Mr. F. D. Ardagh, Assistant Conservator posted to the Nilgiri District to do duty under the orders of the District Forest officer Nilgiri District from or after 10th October 1920.

7. M. R. Ry. A. K. Kandan Ranger V grade on relief by Mr. T. G. Sankaran Nair Ranger III grade posted to Mudumalai Range to relief of No. 8 not later than 19—10—20.

8. Captain W. G. Dyson M. C. on relief by No. 7 to take charge of Pollachi Range.

9. M. R. Ry. C P. Garudachala Mudaliar Ranger III grade on relief by No. 8 to work under the orders of the District Forest officer, South Coimbatore.

10. M. R. Ry. T. I. Chakko Ranger III grade on return from leave posted to charge of Sigur Range.

11. M. R. Ry. Jesudasan Pillai on relief by No. 10 posted to Uppinangadi Range, South Mangalore to relieve Ranger K. Chaikku.

12. A. Kadir Batcha Forester I grade appointed to act as Ranger VII grade from 12—9—1920 until further orders.

12th October 1920.

M. R Ry. S. V. Devadasan Avl. D. F. O. Madura granted privilege leave for four months with effect from date of relief.

M R. Ry. K A Chengappa Avl. to be D. F. O. Madura. during the absence of M. R. Ry. S. V. Devadasan Avl. on leave until further orders.

19th October 1920.

1. M. R. Ry. P. Dhananjaya Rao Ranger V grade on 3 month's leave from 4—9—20 permitted to rejoin duty and posted to Chandragiri Range charge.

2. M. R Ry. M. P. Halasyanatha Ayyar Acting Ranger VII grade in charge of above Range on relief by No. 1, posted for boundary Verification under the orders of D. F. O, Chittoor.

3. M. R Ry. S. Ramachandra Ayyar Ranger III grade *sub-protem* in charge of Chamala Range on relief by M. R. Ry. S. Chinnadorai Pillai Ranger II grade on return from leave transferred to Guntur District for special duty under the D. F. O

4. M. R. Ry N. C. Mahadeva Ayyar Ranger VII grade posted to charge of Palnad Range to continue in charge of the range until further orders.

5. M. R. Ry. T. G Sitarama Mudaliar, Ranger VII grade on special duty in Anantapur District, transferred to Chittoor District as Assistant Range Officer, Madanapalle Range.

6. Privilege leave to M. R. Ry. B. S. Ramaswami Ayyar Ranger V grade North Coimbatore District is extended by 2 months in addition to what is already sanctioned.

26th October 1920.

The six weeks' privilege leave from 3—9—20 granted to M. R. Ry. Chinnadorai Pillai, Ranger II grade, in charge of Chamala Range, Chittoor Dt., is extended by two weeks.

M. R. Ry. T. S. Narayanaswami Chetty, Ranger VII grade in charge of Sidhout Range, N. Cuddapah Dt. granted privilege leave for one month from 6—10—20.

M. R. Ry. V. P. Narayana Menon, Ranger IV grade in charge of Badval range, North Cuddaph Dt. to be in additional charge of Sidhout range.

M. R. Ry. K. Jayaraman, Ranger VI grade posted to S. Salem division for special duty.

M. R. Ry. K. Karunakara Nambiar, Ranger, IV grade posted to S. Mangalore Dt. to work under the orders of the D. F. O. for completion of the work of reservation of Nileshwar Magnes.

Balance Sheet of the Madras Forest College Magazine for the year 1919 – 20.

RECEIPTS.

Serial No.	Particulars.	Amount Rs.	A.	P.
1	Annual subscription for 1919 – 20 from 228 old members at Re. 1 each	228	0	0
2	Entrance donation from : 2 Imperial Officers at Rs. 10 each 20 0 0 The Madras Forest College Library 10 0 0 29 Subordinate Officers at 2 Rs. each 58 0 0	88	0	0
3	Annual subscription for 19 - 20 from 32 new members at Re 1 each ...	32	0	0
4	Receipts towards advertisements ...	60	0	0
5	Interest accrued on deposit in Bank	19	1	5
6	Cash balance with Treasurer at the beginning of the year...	43	12	8
7	Balance at bank at the beginning of the year...	623	0	3
	Total...	1093	14	4

EXPENDITURE.

Serial No.	Particulars.		Amount Rs.	A.	P.
1	* *Paper :-*				
	White paper for Magazine	203- 6-5			
	„ „ Wrappers for five years' use	45- 4-0			
	Green cover-paper	26- 1-0			
	Tissue paper	3- 0-0	277	11	5
2	* *Printing charges :-*				
	Printing of Magazine	209-13-0			
	„ Wrappers	6- 0-0			
	„ Receipt book	6-12-0			
	Two blocks (for Dec. No.)	5- 8-0	228	1	0
3	*Postal charges .–*				
	Despatch of copies	29-15-6			
	Business correspondence	0- 9-9	30	9	3
4	*Binding charges* ...		18	0	0
5	*Stationery* ...		5	4	0
6	*Sundries* ...		5	11	0
	Cash balance with Treasurer ...		0	11	0
	Balance at Bank ...		527	14	8
	Total...		1093	14	4

* Owing to an increase in the size of certain numbers of Volume IV (1919 - 20), the printing of wrappers for five years' use, and the general rise in the cost of paper and printing, the expenditure under * these heads has gone up.

G. Viswanatham,
Editor & Treasurer.

Abdul Karim,
Business Superintendent.

C. C. WILSON,
President.

Advertisements.

The following is a list of timber species required for the Gass Museum. Such of them as are procurable may be sent to the Principal *together with botanical specimens pertaining to each species and a sample of bark about 8″ square.*

The long panels should be as broad as available, 6 ft. long and 3″ thick. The short panels 2 ft. long and I″ thick. (breadth, maximum available.)

Aglaia Roxburghiana
Aquilaria Agallocha
Albizzia procera
Albizzia stipulata
Acacia dealbata
Acrocarpus fraxinifolius
Chickrassia tabularis
Carallia integerrima
Dillenia indica
Diospyros tomentosa
Diospyros paniculata
Diospyros ebenum
Delbergia sissoo
Erythroxylon monogynum
Gmelina arborea
Gluta travancorica
Grewia asiatica
Hardwickia binata
Holoptelea integrifolia
Hydnocarpus Wightiana
Hereteria papilio
Litsaea zeylanica
Machilus macrantha
Premna tomentosa
Sterculia fœtida
Sterculia villosa
Sterculia guttata
Stereospermum chelonoides
Tetrameles nudiflora

* * *

The following numbers of the Indian Forester are required for the ***Students'*** Library. The Principal will be glad receive any that officers can spare :—

1. Volume 1, 2 and 3 for 1875 – 76, 1876 - 77 ; and 1877 - 78.
2. Volume 6 for 1880 - 81.
3. Volume 14 for 1888 - January, February, March, April, September, October, and December numbers.
4. Volume 15, 16, for 1889 and 1890.
5. Volume 18 for 1892 August, September, October, November
6. Volume 19 for 1893 February number.
7. Volume 20 for 1894 July and August number.
8. Volume 21 for 1895.
9. Volume 24 for 1 98 March and April numbers.
10. Volume 25 for 1899 April, May, June and August, September, October and December numbers.
11. Volume 26 for 1900 August number.
12. Volume 39 for year 1913 - Junuary, April, September and October Nos.
13. Volume 44 for the year 1918 - March number.

* * *

Wanted to purchase.

Eight copies Gamble's "Manual of Indian Timber" Apply stating Edition, Price, Condition to:

PRINCIPAL, MADRAS FOREST COLLEGE,
Lawley Road P. O. Coimbatore.

* * *

The Principal will be glad to purchase copies of the undermentioned numbers of the Madras Forest College Magazine at 8 anns each:-

Volume I. All the four numbers.

Volume II. No. 1.

The Principal will be glad to receive trophies for the Gass Museum, either as a permanent gift, or, on loan for not less than 18 months ; also any old records, maps, etc. of historical interest to the Department, for the College Library.

* * *

Wanted

The following numbers of the Standard history of the War:—

Volume *X.* No. 168

Volume XI. Nos. 188 to 192

Volume XII. Nos. 227 to 242

PRINCIPAL MADRAS FOREST COLLEGE,
Coimbatore.

* * *

Indian Forester Prize. 1921

The subject for the above prize for the current year will be :—

" The Teak Tree."

Special emphasis should be laid on concrete examples taken from actual experience.

The Prize is open to all present Students of the College. A prize for an essay on a different subject has also been allotted for all past Madras Forest College students.

No award for either prize will be made unless a satisfactory standard is reached.

The Essays should be clearly writteen or typed *on one side of the paper only* and must reach the Principal not later than 1st June 1921. Essays should not exceed 2000 words; in previous years students have been disqualified for infringing this rule. Each Essay must bear a motto; the motto is also to be written on a sealed envelope containing the name of the competitor; the name of the competitor is *not to be written on the Essay.* Each Essay must be the bonafide unsided work of the Competitor submitting it.

* * *

A prize allotted from the "Indian Forester" Fund will be awarded to the past student of the Madras Forest College who submits the best Essay (limited to 2000 words; in previous years students have been disqualified for infringing this rule) on the following subject:—

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The Essay should be clearly written or typed *on one side of the paper only* and must reach the Paincipal, Madras Forest Collge not tater than 1st June 1921.

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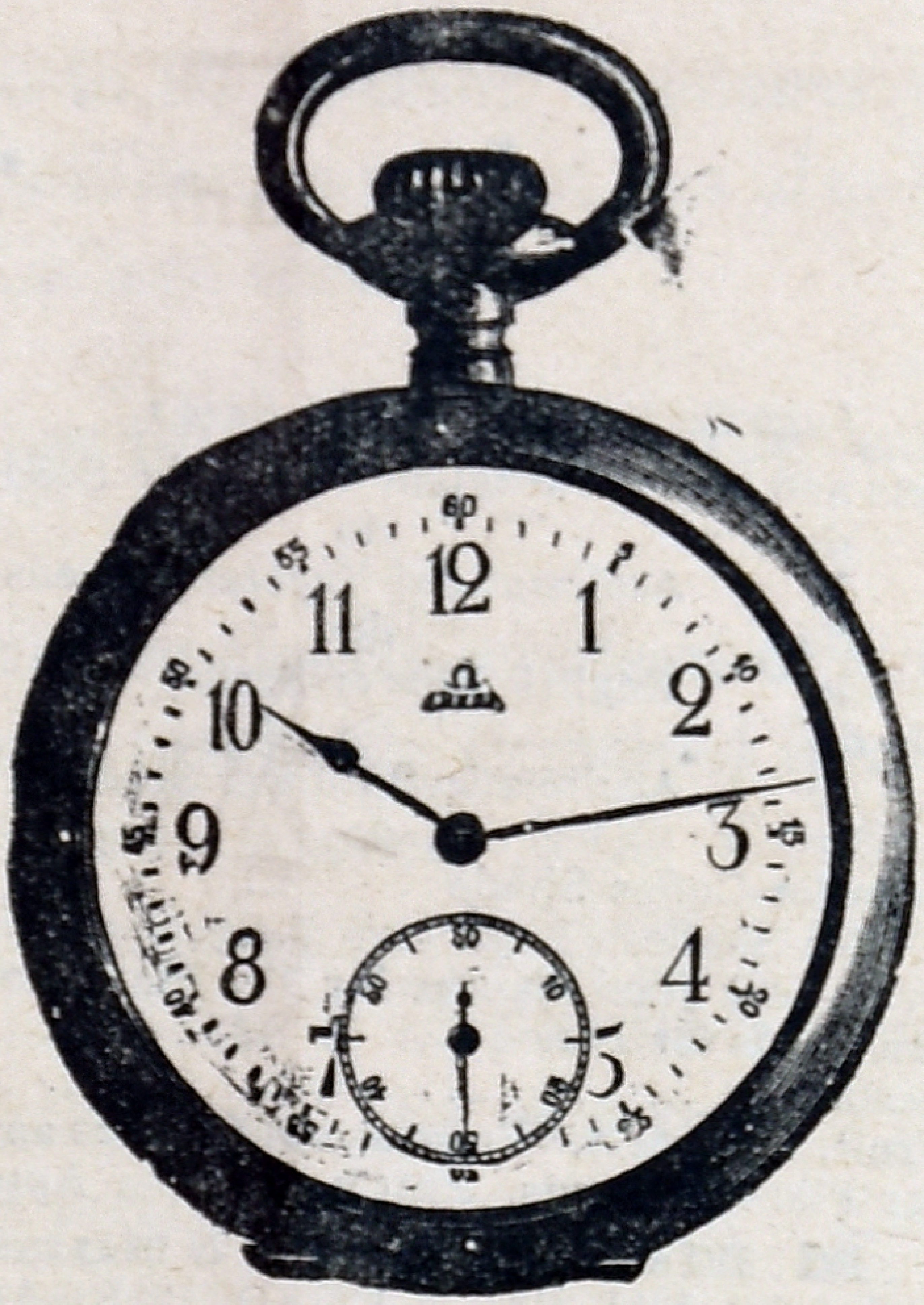

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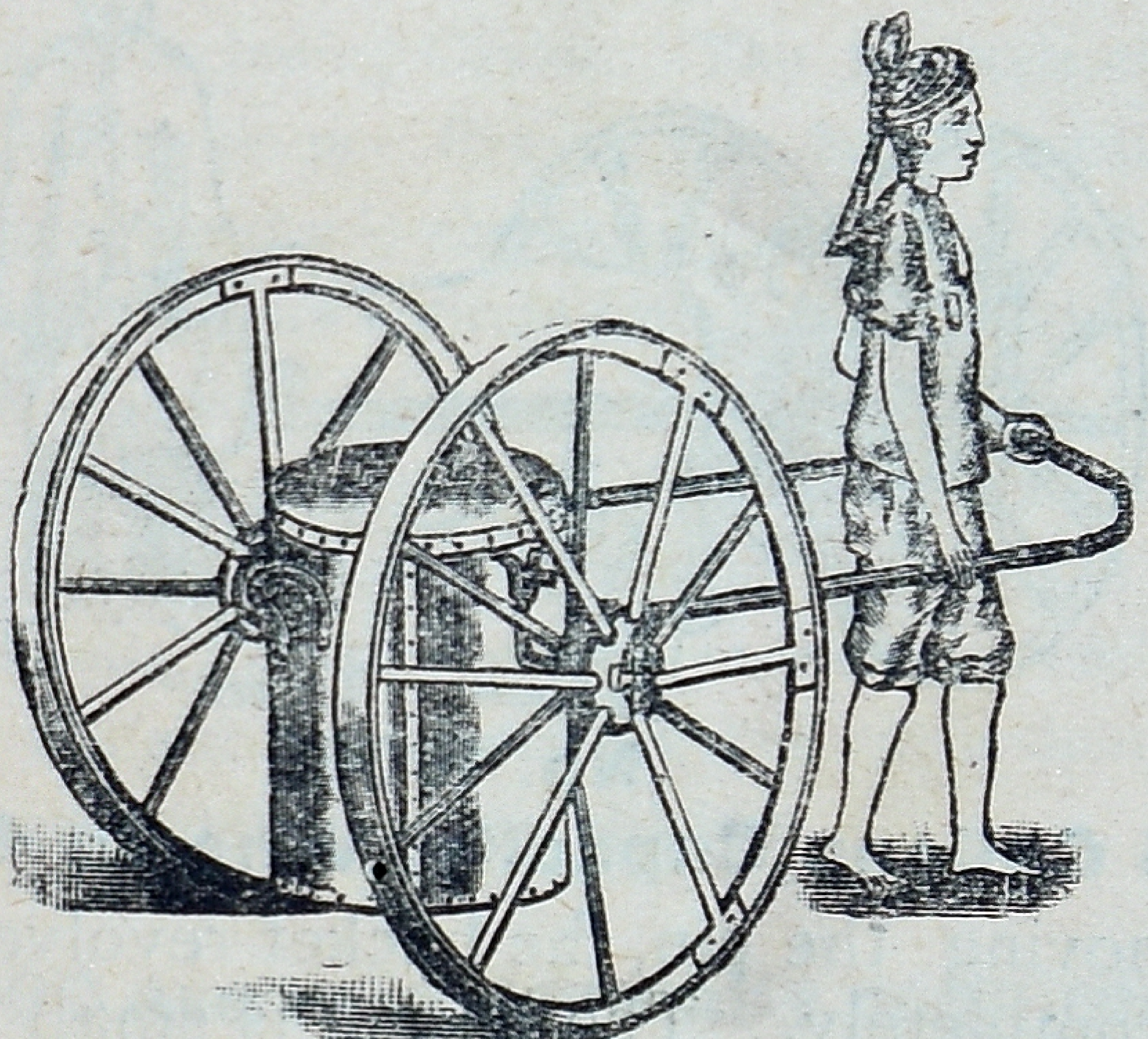

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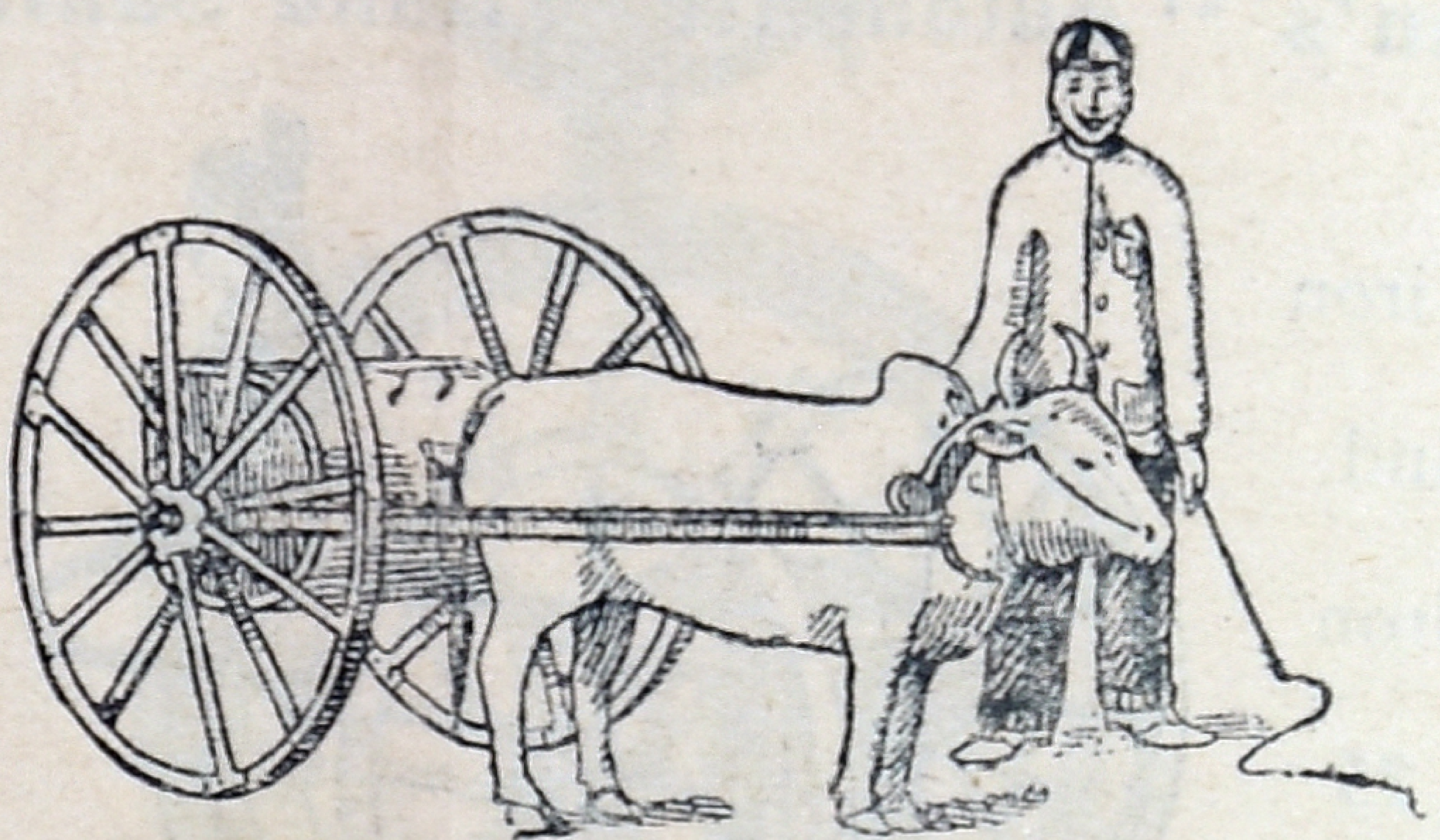

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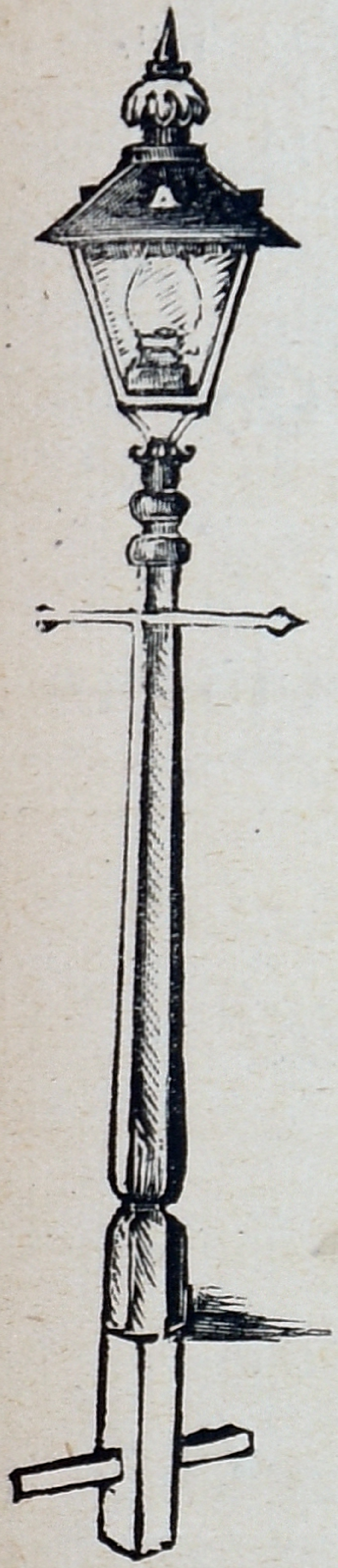

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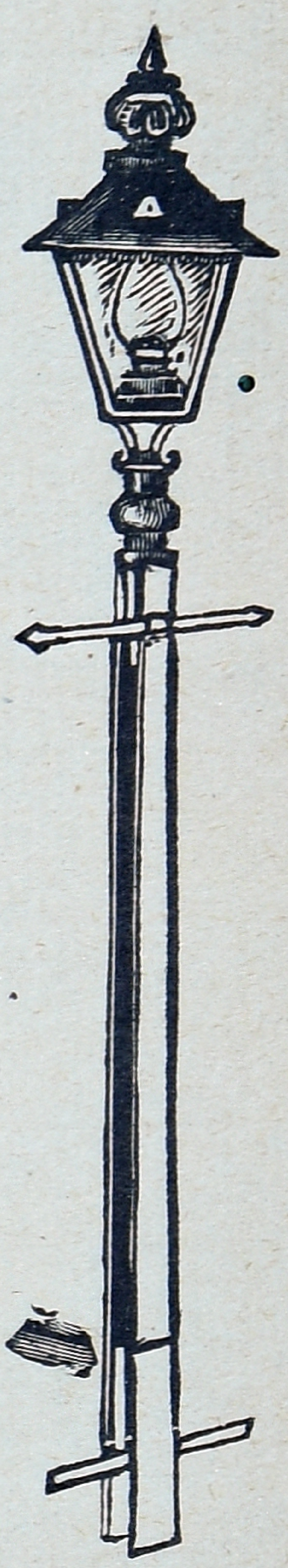

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